



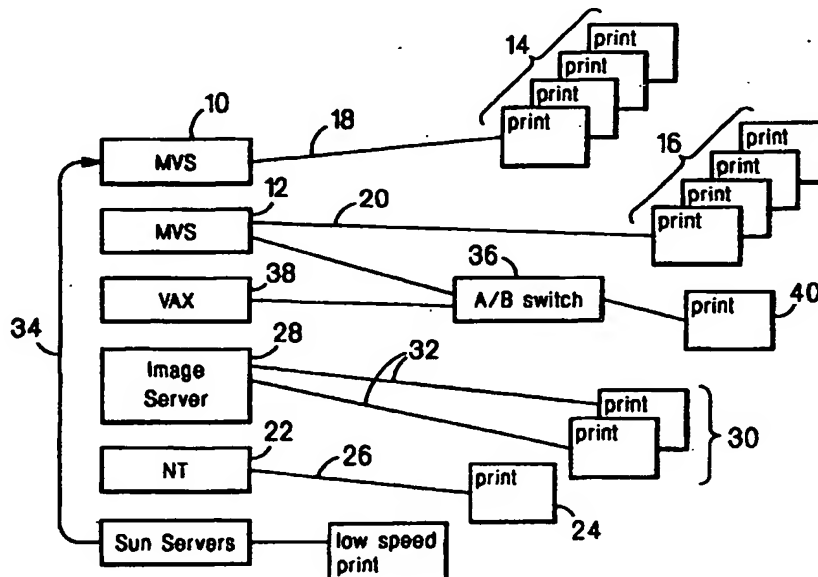
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(54) Title: OPEN SYSTEMS PRINTING

(57) Abstract

A method for open systems printing including routing print jobs automatically from different types of source computers to different types of printers without the source computers selecting printers for each print job. A method for open systems printing including routing print jobs automatically from an arbitrary number of source computers to an arbitrary number of printers without the source computers selecting printers for each print job. A method for printing including controlling the printing of print jobs on high-speed production printers through a graphical user interface. A print server for use with different types of source computers and different types of printers, the print server directs print jobs received from the source computers to the printers without the source computers selecting printers for each print job. A print server for use with an arbitrary number of similar types of source computers and an arbitrary number of similar types of printers, the print server directs print jobs received from the source computers to the printers without the source computers selecting printers for each print job. An open systems printing environment including a source computer connected to a first network, a print server connected to the first network and a second network, an output manager connected to the second network, and a printer connected to the output manager, the print server directs print jobs generated by the source computer to the printer.



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OPEN SYSTEMS PRINTING

Background

This invention relates to open systems printing.

Printing is often a proprietary sub-system of computer operating systems. This is especially true for
5 production or high-speed printing (i.e., greater than 100 pages per minute). For example, IBM™ MVS™ mainframes 10, 12 (Fig. 1) are connected to IBM™ printers 14, 16 over IBM™ bus-and-tag channels 18, 20, Microsoft™ NT™ server 22 is connected to NT™ printer 24 over proprietary bus 26, and
10 image server 28 is connected to image printers 30 over proprietary busses 32. In a typical MVS™ environment, print files are generated from a mainframe MVS™ application and sent to a Job Entry Sub-System (JES). The print job is routed over the proprietary bus to a printer directly
15 connected to the proprietary bus. The job is then printed using JES commands.

When new processors are developed and installed, new printers corresponding to the new technology are also installed. Dedicated, high-bandwidth channel bus extenders
20 are used to connect remote high-speed printers to a central mainframe location.

Client/server systems typically include smaller desktop computers (clients) connected to larger more powerful computers (servers). To print a client/server
25 print stream on a high-speed printer, the print stream is typically routed (arrow 34) to a mainframe, e.g., MVS™ 10, and then routed to a high-speed printer, e.g., printers 14. The mainframe is effectively made a high-cost print server for the distributed client/server system.

Switch 36 enables either MVS™ 12 or a VAX™ mainframe 38 to send print streams to printer 40. If MVS™ 12 is configured to send print streams through switch 36 and a user instead wants to send print streams from VAX™ 38 to the printer, the user enables the VAX™ and disables the MVS™ and configures the switch accordingly. Approximately 20 minutes to an hour is required to re-configure the mainframes and switch. A new switch is needed to allow a different hardware platform, e.g., NT™ server 22, to share a printer with MVS™ 12 and/or VAX™ 38.

Summary

In general, in one aspect, the invention features a method for open systems printing including routing print jobs automatically from different types of source computers to different types of printers without the source computers selecting printers for each print job. In general, in another aspect, the invention features a method for open systems printing including routing print jobs automatically from an arbitrary number of source computers to an arbitrary number of printers without the source computers selecting printers for each print job.

Implementations of the invention may include one or more of the following. Routing may include sending the print jobs from the source computers to a print server and sending the print jobs from the print server to output managers connected to the printers. The print jobs may be sent from the source computers to the print server over a first network, e.g., a TCP/IP network, and the print jobs may be sent from the print server to the output managers over a second network, e.g., a local area network. The method may include transforming data in the print jobs into a format compatible with the printers, and the transformation may be carried out by the print server or an

output manager. After sending the print jobs from the source computers to the print server, the method may include storing the print jobs in a server spool coupled to the print server. Before sending the print jobs from the print server to the output managers, the data in the print jobs may be manipulated, for example, two print jobs may be merged into one print job. The method may also include printing the print jobs on paper, sending the print jobs to an electronic mail system, recording the print jobs on microfiche, and recording the print jobs on laser disk. Each of the print jobs may include at least two reports and routing may include sending the print jobs from the source computers to a print server and sending individual reports from the print server to output managers connected to the printers. After sending the print jobs from the source computers to the print server, the method may include bringing the source computers down for maintenance while printing the print jobs.

In general, in another aspect, the invention features a method for printing including controlling the printing of print jobs on high-speed production printers through a graphical user interface.

Implementations of the invention may include one or more of the following. The method may include receiving the print jobs at a print server coupled to the graphical user interface and listing the received print jobs in the graphical user interface. Controlling may include selecting a print job from the list of received print jobs, determining if a printer coupled to the print server has a set-up compatible with the selected print job's set-up, and sending the selected print job from the print server to an output manager connected to the printer. Selecting may include dragging-and-dropping the selected print job from

the list of print jobs onto a printer icon, and the method may also include preventing the drag-and-drop of the selected print job if the printer set-up is determined to be incompatible with the selected print job's set-up.

5 In general, in another aspect, the invention features a print server for use with different types of source computers and different types of printers, the print server directs print jobs received from the source computers to the printers without the source computers selecting
10 printers for each print job. In general, in another aspect, the invention features a print server for use with an arbitrary number of similar types of source computers and an arbitrary number of similar types of printers, the print server directs print jobs received from the source computers
15 to the printers without the source computers selecting printers for each print job.

 Implementations of the invention may include one or more of the following. The print server may include an input receiver, coupled to the source computers, for
20 receiving the print jobs from the source computers, a server spool, coupled to the input receiver, for storing received print jobs, a queue manager, coupled to the server spool and the input receiver, for directing each of the print jobs to a selected one of the printers through an output manager,
25 and a data transformer, coupled to the server spool, for converting data in print jobs into a format compatible with the corresponding selected printers.

 In general, in another aspect, the invention features an open systems printing environment including a
30 source computer connected to a first network, a print server connected to the first network and a second network, an output manager connected to the second network, and a printer connected to the output manager, the print server

directs print jobs generated by the source computer to the printer.

Implementations of the invention may include one or more of the following. The open systems printing environment may also include a server spool coupled to the printer server and a graphical user interface coupled to the print server.

Advantages of the invention may include one or more of the following. Print streams generated on an arbitrary number of dissimilar/similar types of source computers, including client/server systems, are efficiently routed to an arbitrary number of dissimilar/similar high speed printing hardware. User application programs on source computers need not be modified, and the number of source computers and the number of printers is scalable. New technology (i.e., types of computers and printing hardware) is easily added to the printing system. Local print management provides cost effective operation of a large print center remote from a data center. A graphical user interface (GUI) provides a flexible, easy-to-use operator interface. Printing may continue when source computers are down for maintenance or due to failures.

Print streams generated by source computers may be manipulated in the open print server prior to being routed to available printing hardware. For example, bank statement data from a mainframe may be merged with image data (i.e., pictures of processed checks) from an image server before being routed to available printing hardware. Merging print streams in the open print server prior to printing reduces the handling required to process the merging of two print streams and reduces errors associated with known physical merging techniques.

Other advantages and features will become apparent from the following description, and from the claims.

Description

Fig. 1 is a block diagram of source computers
5 directly connected to printers.

Figs. 2 and 3 are a block diagrams of an open systems printing environment.

Fig. 4 is a block diagram of the TCP/IP protocol stack.

10 Fig. 5 is a detailed block diagram of an open systems printing environment.

Figs. 6-31 are video screen displays of a graphical user interface to an open systems printing environment.

Referring to Fig. 2, an open systems printing
15 environment 50 includes an open print server 52 connected to source computers 54 through a Transmission Control Protocol/Internet Protocol (TCP/IP) network 56. The open print server receives print jobs from the source computers and efficiently routes the jobs over a local area network
20 (LAN) 58 to various output managers 60. The output managers then have the jobs printed on directly connected printers 62.

TCP/IP is a communications protocol that was developed under contract from the United States Department
25 of Defense in the 1970's to connect dissimilar computer systems. Today TCP/IP is a defacto standard after becoming the network protocol of choice for corporate data networks. TCP/IP is flexible and available on a wide range of hardware platforms. The protocol enables programmatic linking and
30 routing of data between dissimilar computer systems. As a result, the open print server accepts print files from different hardware platforms, including IBM™ MVS™ mainframes 64 (Figs. 2 and 3), UNIX servers 66, Microsoft™ Windows NT™

servers 68, IBM™ AS/400 servers 70, and Digital Equipment Corporation™ VAX™ mainframes 72.

The highest level of TCP/IP is Application Layer 74 (Fig. 4). User level programming is incorporated at the top of the TCP/IP protocol stack at the Application layer. For example, File Transfer Protocol (FTP) is an application layer program. The Application Layer permits computers to connect to and work together over the network.

TCP layer 76 defines the transport standard, providing end-to-end reliability and sequencing of transmitted bytes of data. This ensures that each byte of data sent from a source computer is received correctly by the open print server. IP layer 78 of the TCP/IP protocol stack provides the routing mechanism / computer addressing information. Addressing information is used to forward bytes from source computers to the open print server. Network Interface layer 80 defines the physical attributes of the network connection.

Many hardware platforms may serve as the open print server. For instance, the open print server may be a Sun™ SPARC™ 10/20 server 82 (Fig. 3), a Sun™ SPARC™ 1000 server 84, an IBM™ RS/6000 server 86, or a Hewlett Packard™ server 88. Many output managers and printers are also available. The printers may be Advance Function Printing (AFP) in Page or Line mode printers, intelligent printer data stream (IPDS) printers, impact, simplex, DUPLEX, line conditioned data stream (LCDS) and intelligent print stream (IPS), roll-fed, sheet-fed, postscript, color, or continuous tone printers. For example, an output manager 90 including an ISI/OPS printer driver 91 may receive print jobs from the open print server and direct them to IBM™ 3800-3 and 4245/8 printers 92, 94 and Siemens™ 2140/2240 page mode printers 96. Similarly, an output manager 97 including a PSF/6000

printer driver 98 may direct print jobs to IBM™ 3900, 3828/9, and 3900 duplex printers 100, 101, 102, an output manager 103 including a SNPS/8000 printer driver 104 may direct print jobs to Siemens™ 2140/2240 IPDS printers 105, Siemens™ page stream printers 106, and Siemens™ twin duplex printers 107, and an output manager 108 including a XEROX™ printer driver 109 may direct print jobs to a XEROX™ printer 110.

Referring to Fig. 5, an open printing client program 114 is installed on each source computer 116 to transfer print files from the source computers to open print server 52 over TCP/IP network 56 without modifying applications running on the source computers. As an example, source computer 116 is an IBM™ MVS™ mainframe. Application 118 running on the MVS™ mainframe transfers print files into a Job Entry Sub-system (JES) which stores the print jobs on one or more MVS™ JES spools 120. Program 114 includes a JES2Q Program for each JES spool available to the MVS™ mainframe. Each JES2Q program searches a corresponding JES spool for print jobs having a destination identification (DESTID) corresponding to an open print server.

The JES2Q programs "strip" print jobs destined for the open print server from the JES spools, add open print server header information to the print jobs, and encapsulate the print jobs into TCP packets. The TCP packets are transferred to the open print server. The JES2Q programs interface with a TCP/IP stack 122 to pass print jobs to TCP/IP network routers via, for example, an IBM™ 3172 gateway 123 (Fig. 2). The routers send the print jobs over the TCP/IP network to an input receiver 124 on the open print server. The JES2Q programs communicate with the input receiver program through a sockets interface (program-to-

program) in the Application level of the TCP/IP protocol stack in a many-to-one relationship.

When the input receiver receives incoming print jobs, it writes the data onto a server spool 126 and uses the header information to log the job in a database, for example, a Sybase, Inc. database. Server spool 126 is a direct access storage device (DASD) and may include mirrored disks. The array contains, for example, four 16 gigabyte partitions which provide a total capacity of 64 gigabytes. File sizes may exceed the UNIX limit of 2 gigabytes. The input receiver notifies Queue Manager 128 of the status of all incoming print jobs.

Open print server error conditions, for instance, insufficient disk space or failed network lines, are communicated to the JES2Q programs on the MVS™ mainframe through TCP/IP error codes. When the error condition is removed, e.g., disk space becomes available, the print job is restarted. Checkpoint restart capabilities allow the print job transmission to be re-initiated from the point of failure reducing the time required to finish the transmission.

The Queue Manager functions as a traffic cop by controlling the distribution of print jobs across the various printers. The Queue Manager forwards database update information to one or more Motif™ graphical user interfaces 130 (GUIs) through an operator application programming interface 132 (API). The GUIs provide print operators with a current view of the printing environment (discussed in more detail below). The Queue Manager also processes commands received from the operator via the GUI and updates the database accordingly. The Queue Manager maintains Job accounting files and server log files and stores these files on the server spool. Job accounting

records 135 are generated in various formats, SMF included. These may be automatically sent to standard billing packages on other computers connected to the TCP/IP network.

While a print job is being received from a source
5 computer, the Queue Manager accesses the print job's header information to determine which print resources are required to print the job and then accesses a resource manager 133 to determine if the required print resources are available.

Print resources include fonts, coded fonts, overlays, page
10 definitions, form definitions, page segments, FCBs, media maps, data maps, and graphics (e.g., logos and signatures). If a required print resource is not available, then the Queue Manager notifies the operator through the GUI.

Similarly, the Queue Manager checks for a required printer
15 set-up, for example, that a required form type is loaded, and notifies the operator if a required printer set-up is not available.

Using the GUI, a print operator selects a job in the server spool and directs the job to a specific printer. The
20 Queue Manager initiates a data transformation (DTF) process 134 corresponding to the selected output manager and printer. The DTF process interrogates the job to determine, for example, if it is an AFP page or line mode job. The DTF process then reads the job from the spool, converts the data
25 stream to, for example, a channel command word (CCW) format compatible with the target printer make/model, and writes the data back onto the spool. The DTF process also updates the database with status information and error condition messages, and this information is made available to the GUI
30 through the Queue Manager.

After a sufficient amount of data has been properly transformed, the Queue Manager notifies the selected output manager that a print job is ready, and the output manager

begins reading the transformed portion of the print job from the server spool. For non-IPDS printers (i.e., Siemens™ 2140, 2240, IBM™ 3800, 4245), the output manager may be a Sun™ SparcClassic™ workstation with a printer adapter card to support the attached printer. For IPDS printers, the output manager may be an IBM™ RS/6000 workstation with PSF/6000 software or an OS/2 workstation with SNPS 8000 software and a Channel emulation card to support the attached printer. In the IPDS printing environment, the output manager reads data from the server spool that has not been transformed and completes the data transformation.

A programmer may generate data application programming interfaces 136 and corresponding DTF processes for manipulating data stored on the print server. For example, many bank statements include data forms listing transactions and account status (accounting data) as well as image forms with graphical representations of processed checks (image data). In the past, these forms were either printed separately and physically merged together before being mailed to the account holder, or the image data was routed to a mainframe where the image data and account data was merged before being printed. Physically merging forms is error prone and may require substantial personnel time. Because image data files are generally large, routing image data to the mainframe may cause bandwidth problems in the network connecting the image server and mainframe requiring the installation of an expensive, high bandwidth bus. This routing may also require a substantial amount of time. The problem is multiplied if the mainframe is remote from the image server.

Through the open print server, data is routed once to the open print server where it is merged into one print job before being printed. After an image print job and an

accounting print job are stored in the server spool, the Queue Manager initiates a merge DTF through a merge data API to merge image and accounting data into one print job. An output manager corresponding to a printer capable of printing both data types is then notified of the print job.

LAN 58 (Fig. 5) and TCP/IP network 56 provide the open printing environment with scalability. Both networks permit many connections, for example, the LAN may have 256 connections. This allows additional source computers and output managers/printers to be easily connected to the environment when printing needs increase. Additionally, the environment may be updated with new technology, e.g., new source computers and output managers/printers, by generating corresponding open printing client programs 114 (Fig. 5) and DTF 134 processes.

Additionally, the TCP/IP network allows large print files to be easily and quickly transmitted from a data center of source computers to a remote print shop including the open print server, output managers, and printers. Because print resources are stored on the open print server, print file transmissions are smaller and require less bandwidth. Once the files are transmitted, the source computers may be brought down for maintenance without interrupting the printers. Local printer management permits efficient use of printer time and capabilities, and because the open print server routes print jobs across various printers, individual printers may be drained of print jobs and brought down for maintenance without bringing down the entire printing environment. Moving printer queue management to the open print server may increase source computer performance by eliminating the need for such a function on the source computers. Source computers need not select, keep track of, or even know of available printers.

Printing/Operator Interface

The GUI provides an operator with complete control over printer management.

Referring to Fig. 6, the GUI includes a main status display 140 that allows the operator to manage the print operation, system configuration, and logging in and out of the system. In addition to standard Motif™ X-Windows™ features, the GUI includes features specific to the open print server. For example, source computer and printer icons 142, 144, respectively, are displayed and indicate through words 146 and the color of the icon the status of the corresponding device. For instance, a green printer icon indicates that the printer is active, paused, or draining, blue indicates that the printer is idle or drained, brown that the print driver is running but that the printer is unavailable, red that the print driver is unavailable, and yellow that operator intervention is required. Similarly, a green source computer icon indicates that the computer is active while a blue source computer icon indicates that the computer is idle.

The operator may double-click a left mouse button on a printer or client icon 142, 144, respectively, to cause additional information (e.g., forms, mode), specific to the corresponding device, to be displayed. A single-click of the right mouse button on a printer icon brings up a pop-up menu of printer functions including pause, resume, cancel job, drain, enable. The user may click the left mouse button on a printer function to cause the corresponding printer to execute that function.

Referring to Figs. 7 and 8, the operator may select a Printer Layout option 146 or a Client Layout option 148 from an Edit menu 150 to cause a Screen Layout Dialog box 152 or a Client Layout Dialog box 154, respectively, to

appear. The operator then uses the dialog boxes to select those printer and source computer icons to be displayed on the main status display window.

Referring to Fig. 9, the operator may select a Job Queue option 156 from a View menu 158 to cause a Job Queue Status table 160 to be displayed. The operator may then sort the Job Queue Status table display using options 162 (Fig. 10) in a Job Queue Status table View menu 164. These sort by options include class, priority, source, status, mode, name, form, criteria, or all jobs.

When the class option is selected, a class pop-up menu 166 (Fig. 11) of alpha codes from A through Z and numeric codes from 0 through 9 is displayed representing classes that the Job Queue Status table may be sorted on. The operator may then select one of these codes to sort the Job Queue Status table. When the priority option is selected, a Job View By Priority Selection Dialog box 168 (Fig. 12) is displayed. The operator may enter the priority on which he would like the Job Queue Status table sorted on. When the source option is selected, a source computer pop-up menu 170 (Fig. 13) is displayed from which the operator may select a source computer to sort the Job Queue Status table on, and when the status option is selected, a status pop-up menu 172 (Fig. 14) is displayed from which the operator may select a status to sort the Job Queue Status table on. Similarly, when the mode option is selected, a mode pop-up menu 174 (Fig. 15) is displayed, when the name or form options are selected, a Selection Entry dialog box 176 (Fig. 16), 178 (Fig. 17), respectively, is displayed, and when the criteria option is selected, a Criteria Display dialog box 180 (Fig. 18) is displayed through which the operator can select a combination of criteria, such as class and priority, to sort on. The operator may select the all jobs

option to cause all jobs to be displayed in the Job Queue Status table.

To perform an operation on a job, the operator selects the job in the Job Queue Status table by clicking the left mouse button on the desired job and selects the desired operation from the Operations menu 182 (Fig. 19). The operations include Hold, Release, Delete, Copy, Change Priority, Change Retention Time, Change Class, Print, and Report Queue. The Hold option allows the operator to put a print job on hold, and the Release option allows the operator to change the status of a print job to ready. When a print job has a ready status, the operator may print the job by selecting the print option and a desired printer from a Print Panel 184 (Fig. 20) or by moving the cursor over the job in the Job Queue Status table, pressing the left mouse button down, and dragging-and-dropping the print job onto the desired printer icon (i.e., drag-and-drop technology). If the print job set-up does not match the printer set-up, for example, the form required for the print job is not loaded on the printer, then the GUI indicates that the print job cannot be printed on the selected printer by not allowing the print option to be selected or by not allowing the print job to be dropped onto the printer icon.

Alternatively, the open print server may be configured to automatically print jobs with a ready status if a printer having a matching set-up is available.

If a job in a secure class is selected, a Security Authorization Dialog box 186 (Fig. 21) is displayed, and the operator must enter an authorized user name 188 and password 190 before an operation may be performed on the selected job.

Each print job may contain one or more reports (i.e., smaller print jobs). When the report queue option is

selected, a Report Queue window 192 (Fig. 22) is displayed. The Report Queue window provides many of the same operational controls at the report level through an Operations menu 194 (Fig. 23) that are provided at the job level through the operations menu in the Job Queue Status table. Report operations include Hold, Release, Delete, Print, Resources, View Report Ticket, and Browse Report. The Hold, Release, Delete, and Print report operations work as described above with respect to print jobs. When the Resources option is selected, a Resources Display window 196 (Fig. 24) is displayed. The Resources Display window shows a list of printer resources required to print the selected report. Each necessary printer resource also includes a status: Unchecked indicates that the Queue Manager has not determined whether the resource is available in the resource manager; Missing indicates that the resource is not available through the resource manager; and Present indicates that the resource is available. Selecting the view report ticket option displays a Report Ticket window 198 (Fig. 25). The following information about a selected report is displayed: job name; data definition name; form used; print date; print start time; print end time; total lines in report; and total pages printed. An operator or a user connected to a source computer may add notes to a report in a notes dialog box 200. For example, the user may add a note telling the operator where to send copies of each report. Selecting the Report Browser option displays a Report Browser window 202 (Fig. 26). The Report Browser window displays the actual contents of a selected report.

Referring back to Fig. 9, selecting the printer status option from the View menu of the Main Status Display window displays a Printer Status display window 204 (Fig. 27) including a one line status summary for each printer.

Through the printer set-up option in the View menu, the operator may configure available printers. When this option is selected, a pop-up menu 206 (Fig. 28) of available printers is displayed, and when a printer is selected from this menu or the operator double-clicks on the printer icon, a printer configuration dialog box 208 is displayed. The operator enters information into this dialog to configure the corresponding printer. Selecting the status log option causes a Status Log 210 (Fig. 29) to be displayed allowing the operator to view and search for recorded events.

System menu 212 (Fig. 30) includes a Print Resource option and a Spool Utilization option. Selecting the Print Resource option displays a Resource Dialog box 214. The Resource Dialog box displays existing resource directory paths for the selected printer and allows the operator to add and delete resource directory paths for the selected printer. Selecting the Spool Utilization option displays a Spool Utilization window 216 (Fig. 31). The Spool Utilization window displays the path name of each directory, the percentage of the total space currently used, total number of megabytes, total number of megabytes currently in use, total number of megabytes available for storage, and total megabytes for each column.

Reference to Microfiche Appendix

A microfiche appendix containing C language source code for open systems printing consisting of 1648 microfiche images on 17 microfiche cards is filed herewith. A portion of the disclosure of the patent document contains material which is subject to copyright protection. The copyright owners have no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or

records, but otherwise reserves all copyright rights whatsoever.

Other embodiments are within the following claims.

For example, multiple open print servers at
5 locations remote from the source computers may be connected
to a common TCP/IP network.

As another example, the term "printers" as used in
this specification refers to many different types of
devices, including, but not limited to, paper printers, e-
10 mail, computer output microfiche (COM) recorders, archival
systems, or computer output laser disk (COLD) recorders.

What is claimed is:

1 1. A method for open systems printing comprising:
2 routing print jobs automatically from different
3 types of source computers to different types of printers
4 without the source computers selecting printers for each
5 print job.

1 2. A method for open systems printing comprising:
2 routing print jobs automatically from an arbitrary
3 number of source computers to an arbitrary number of
4 printers without the source computers selecting printers for
5 each print job.

1 3. The method of claims 1 or 2, wherein routing
2 includes:
3 sending the print jobs from the source computers to
4 a print server; and
5 sending the print jobs from the print server to
6 output managers connected to the printers.

1 4. The method of claim 3, wherein the print jobs
2 are sent from the source computers to the print server over
3 a first network and the print jobs are sent from the print
4 server to the output managers over a second network.

1 5. The method of claim 4, wherein the first network
2 comprises a TCP/IP network and the second network comprises
3 a local area network.

1 6. The method of claim 3, further comprising:
2 transforming data in the print jobs into a format
3 compatible with the printers.

1 7. The method of claim 6, wherein the data is
2 transformed by the print server.

1 8. The method of claim 6, wherein the data is
2 transformed by the output managers.

1 9. The method of claim 3, further comprising, after
2 sending the print jobs from the source computers to the
3 print server:

4 storing the print jobs in a server spool coupled to
5 the print server.

1 10. The method of claim 3, further comprising,
2 before sending the print jobs from the print server to the
3 output managers:

4 manipulating data in the print jobs.

1 11. The method of claim 3, further comprising
2 before sending the print jobs from the print server to the
3 output managers:

4 merging at least two of the print jobs into a single
5 print job.

1 12. The method of claim 3, further comprising:
2 printing the print jobs on paper.

1 13. The method of claim 3, further comprising:
2 sending the print jobs to an electronic mail system.

1 14. The method of claim 3, further comprising:
2 recording the print jobs on microfiche.

1 15. The method of claim 3, further comprising:
2 recording the print jobs on laser disk.

1 16. The method of claims 1 or 2, wherein each of
2 the print jobs include at least two reports and routing
3 includes:

4 sending the print jobs from the source computers to
5 a print server; and

6 sending individual reports from the print server to
7 output managers connected to the printers.

1 17. The method of claim 3, further comprising,
2 after sending the print jobs from the source computers to
3 the print server:

4 bringing the source computers down for maintenance
while printing the print jobs.

1 18. A method for printing comprising:

2 controlling printing of print jobs on high-speed
3 production printers through a graphical user interface.

1 19. The method of claim 18, further comprising:

2 receiving the print jobs at a print server coupled
3 to the graphical user interface; and

4 listing the received print jobs in the graphical
5 user interface.

1 20. The method of claim 19, wherein controlling
2 further includes:

3 selecting a print job from the list of received
4 print jobs;

5 determining if a printer coupled to the print server
6 has a set-up compatible with the selected print job's set-
7 up; and

8 sending the selected print job from the print server
9 to an output manager connected to the printer.

1 21. The method of claim 20, wherein selecting
2 includes:

3 dragging-and-dropping the selected print job from
4 the list of print jobs onto a printer icon.

1 22. The method of claim 21, further comprising:

2 preventing the drag-and-drop of the selected print
3 job if the printer set-up is determined to be incompatible
4 with the selected print job's set-up.

1 23. A print server for use with different types of
2 source computers and different types of printers, the print
3 server directs print jobs received from the source computers
4 to the printers without the source computers selecting
5 printers for each print job.

1 24. A print server for use with an arbitrary number
2 of similar types of source computers and an arbitrary number
3 of similar types of printers, the print server directs print
4 jobs received from the source computers to the printers
5 without the source computers selecting printers for each
6 print job.

1 25. The print server of claims 23 or 24,
2 comprising:

3 an input receiver coupled to the source computers,
4 the input receiver receives the print jobs from the source
5 computers;

6 a server spool coupled to the input receiver, the
7 server spool stores received print jobs;

8 a queue manager coupled to the server spool and the
9 input receiver, the queue manager directs each of the print
10 jobs to a selected one of the printers through an output
11 manager; and

12 a data transformer coupled to the server spool, the
13 data transformer converts data in print jobs into a format
14 compatible with the corresponding selected printers.

1 26. An open systems printing environment comprising

2 a source computer connected to a first network;

3 a print server connected to the first network and a
4 second network;

5 an output manager connected to the second network;

6 and

7 a printer connected to the output manager, the print
8 server directs print jobs generated by the source computer
9 to the printer.

1 27. The open systems printing environment of claim
2 26, further comprising:

3 a server spool coupled to the printer server.

1 28. The open systems printing environment of claim
2 26, further comprising:
3 a graphical user interface coupled to the print
4 server.

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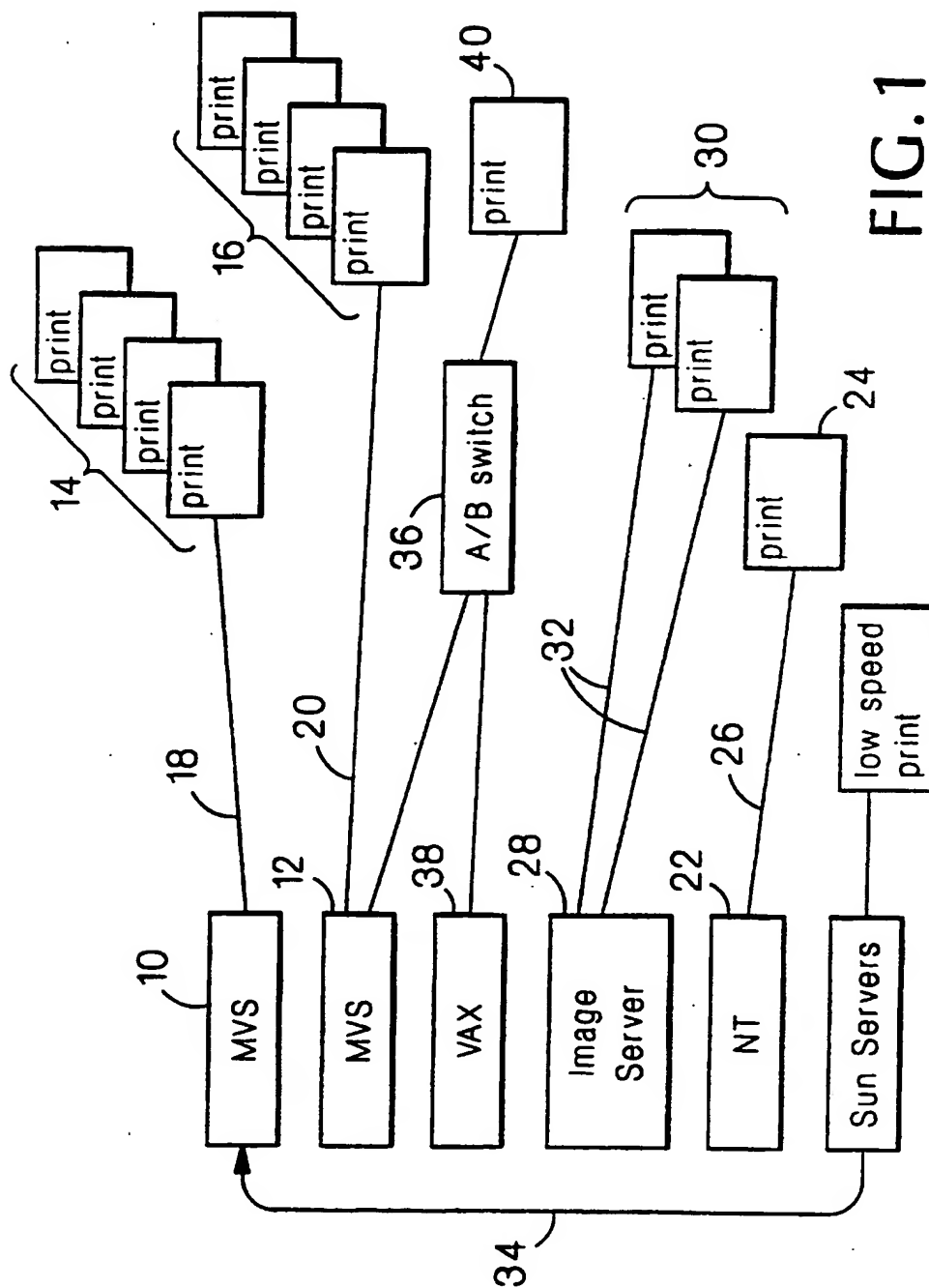


FIG. 1

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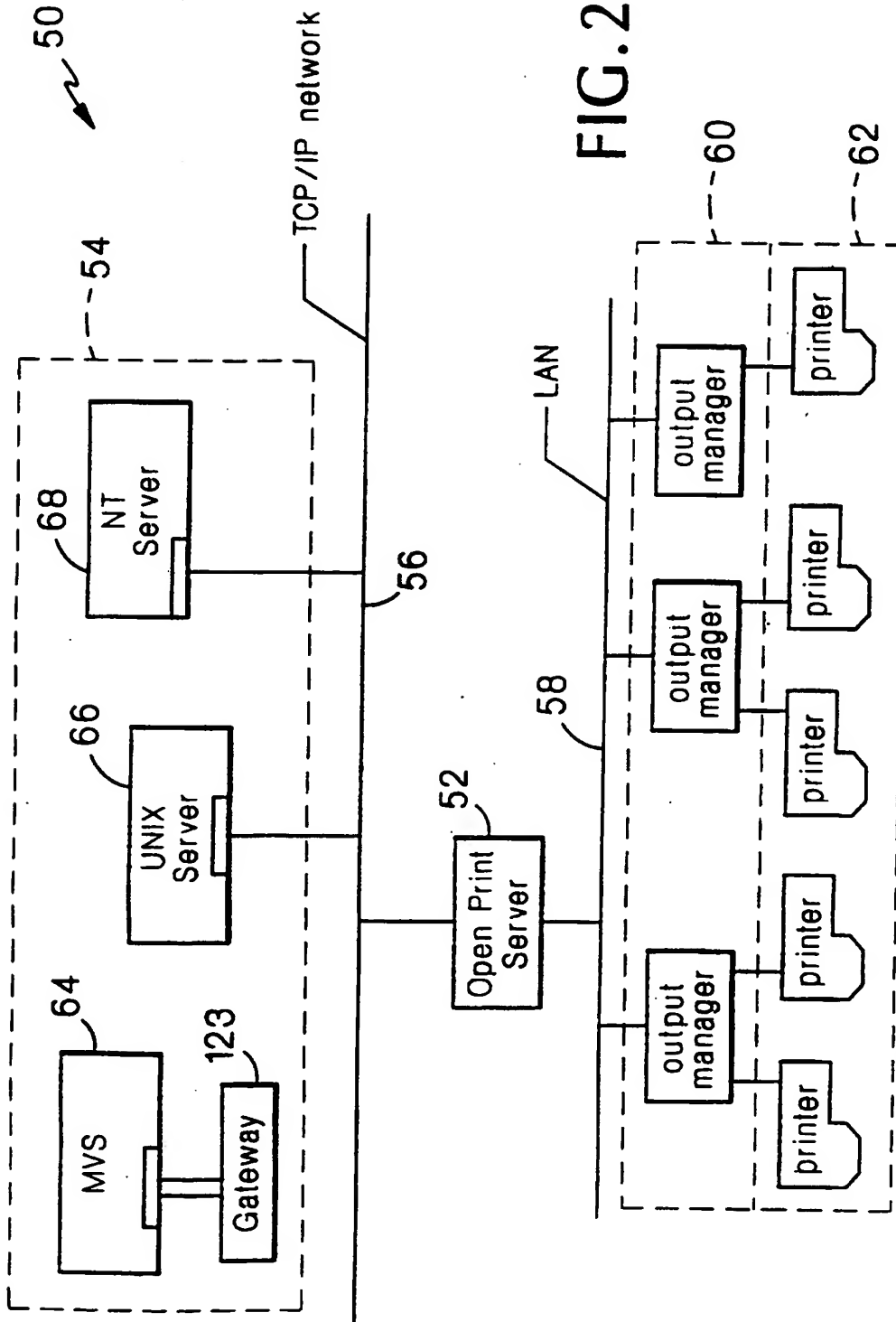


FIG. 2

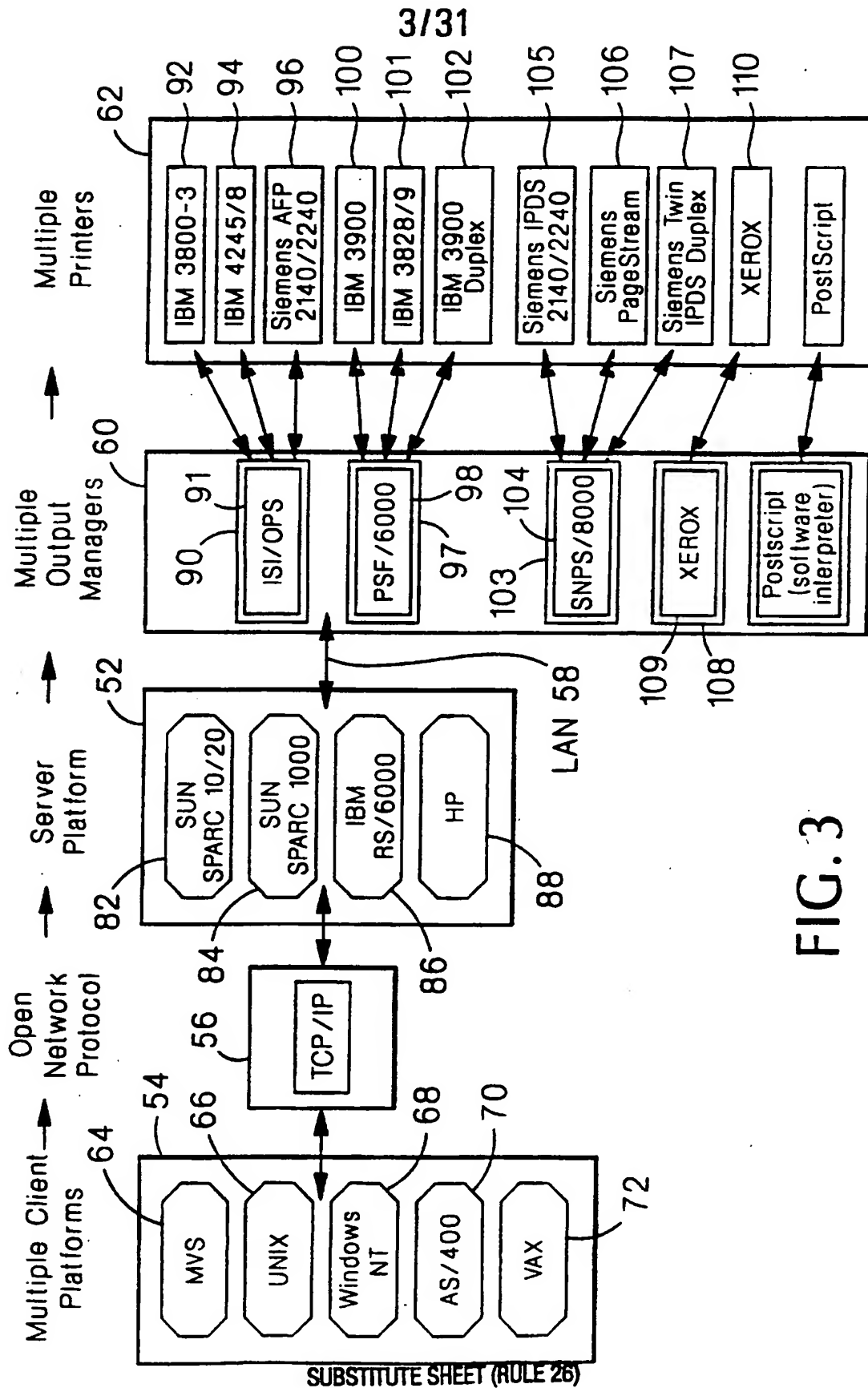


FIG. 3

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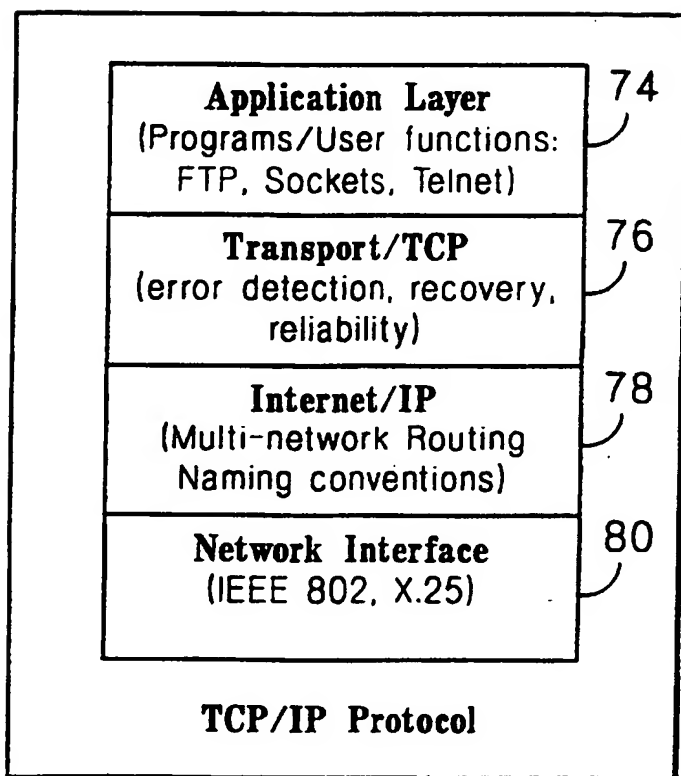


FIG. 4

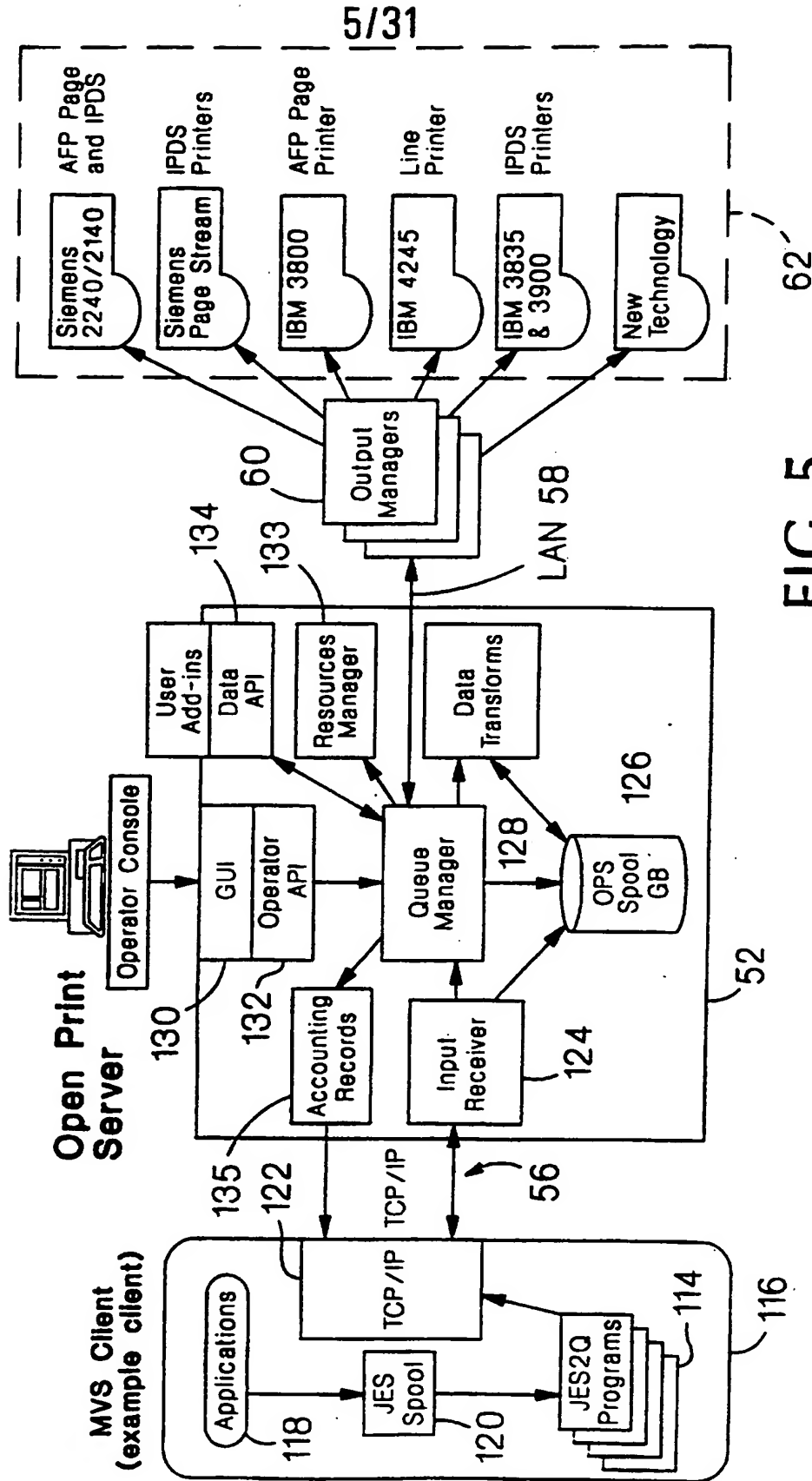


FIG. 5

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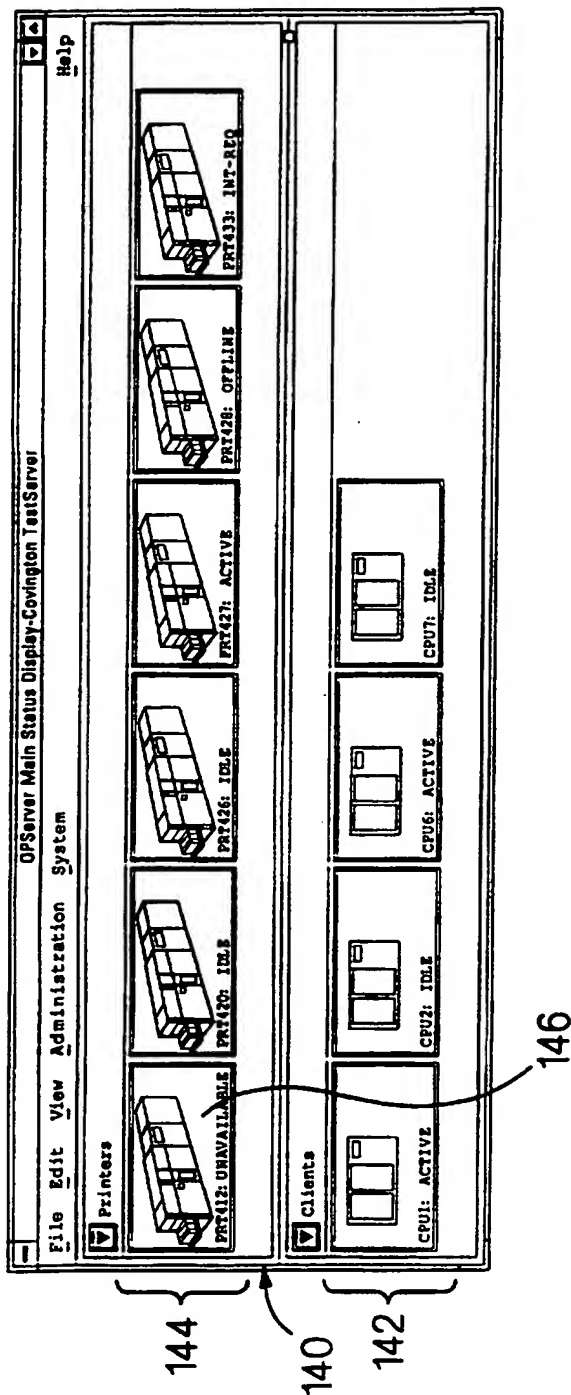


FIG. 6

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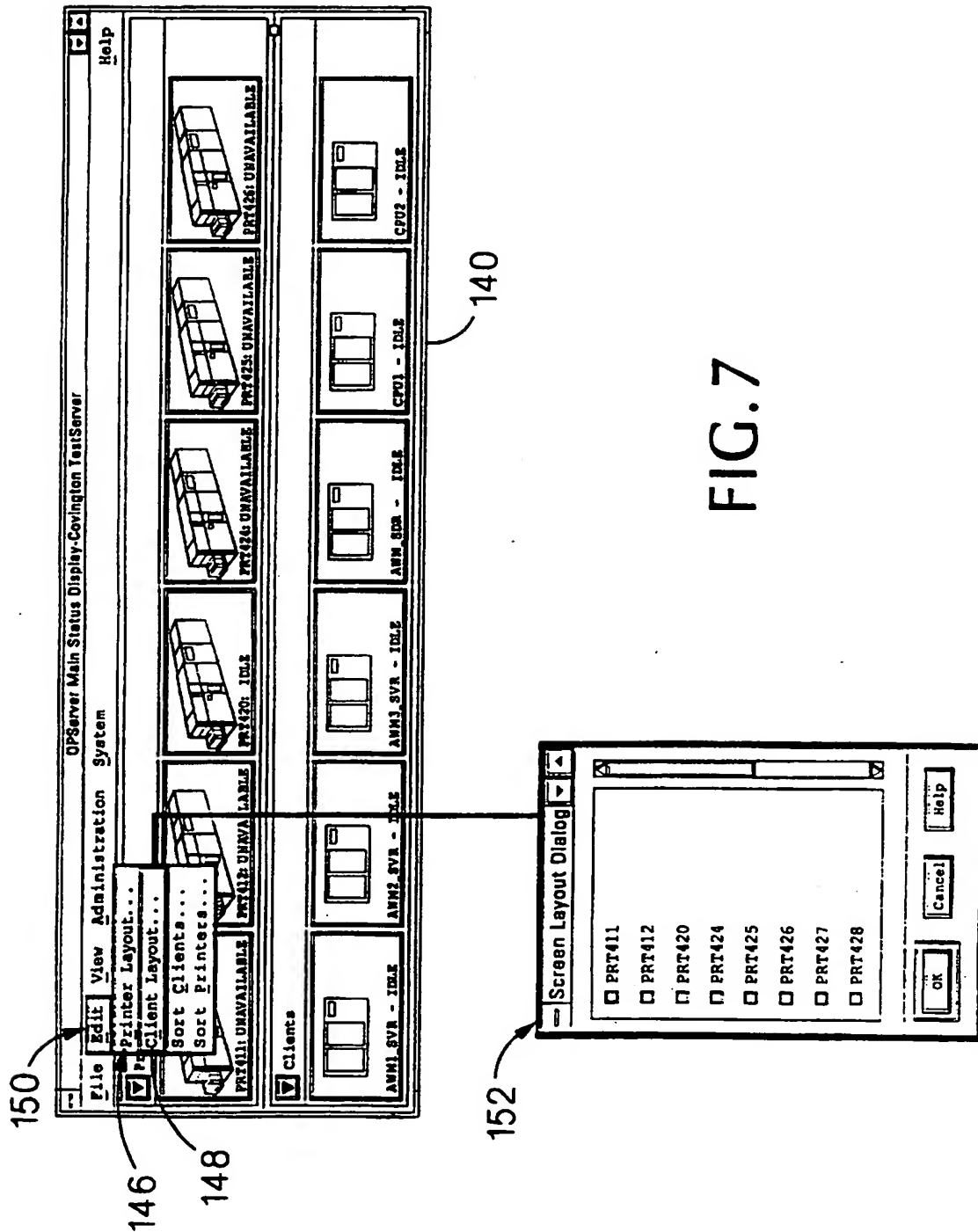
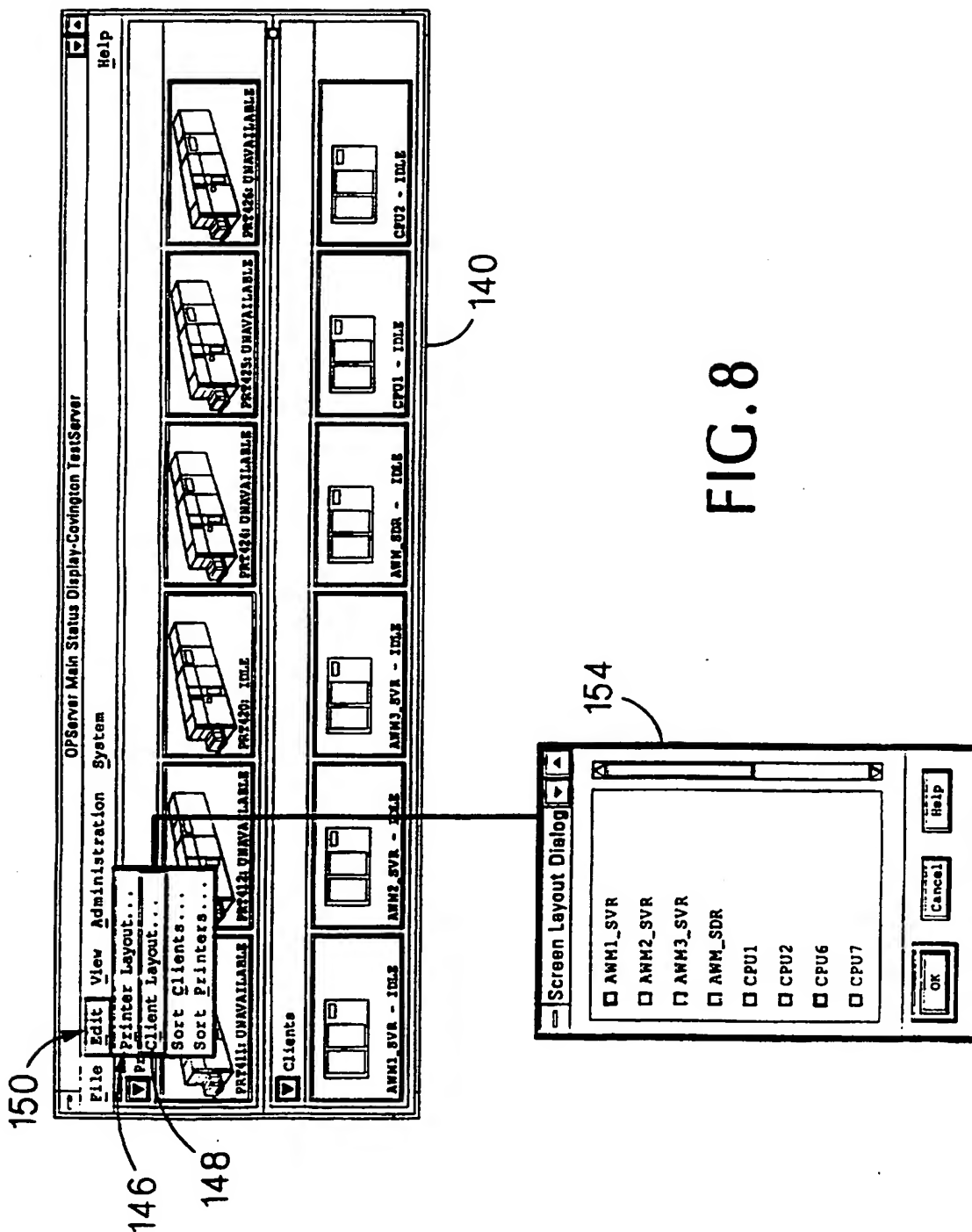


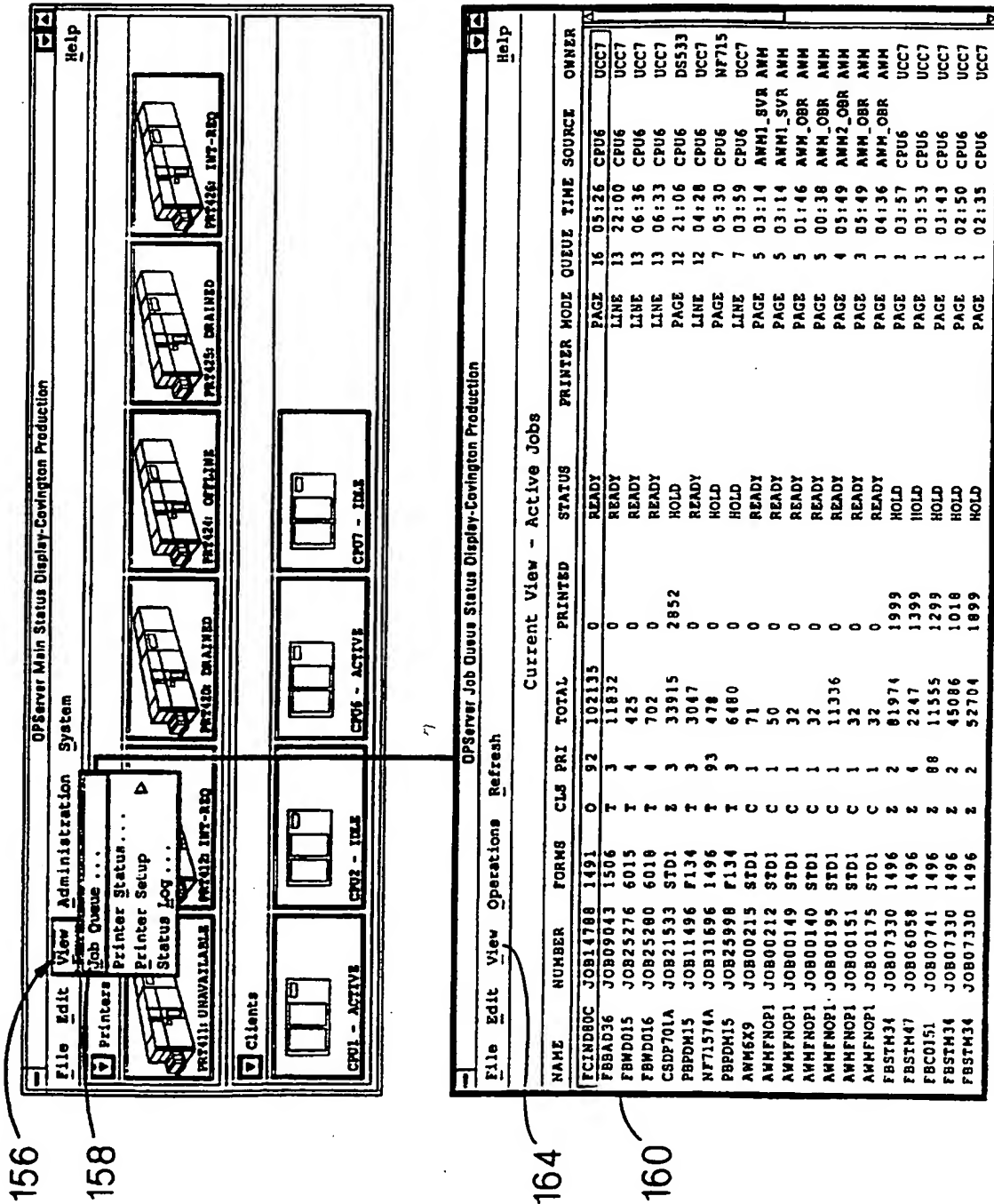
FIG. 7

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FIG. 9



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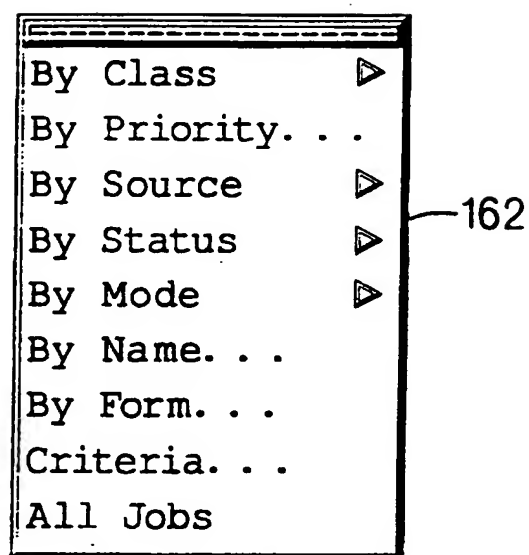


FIG. 10

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FIG. 11

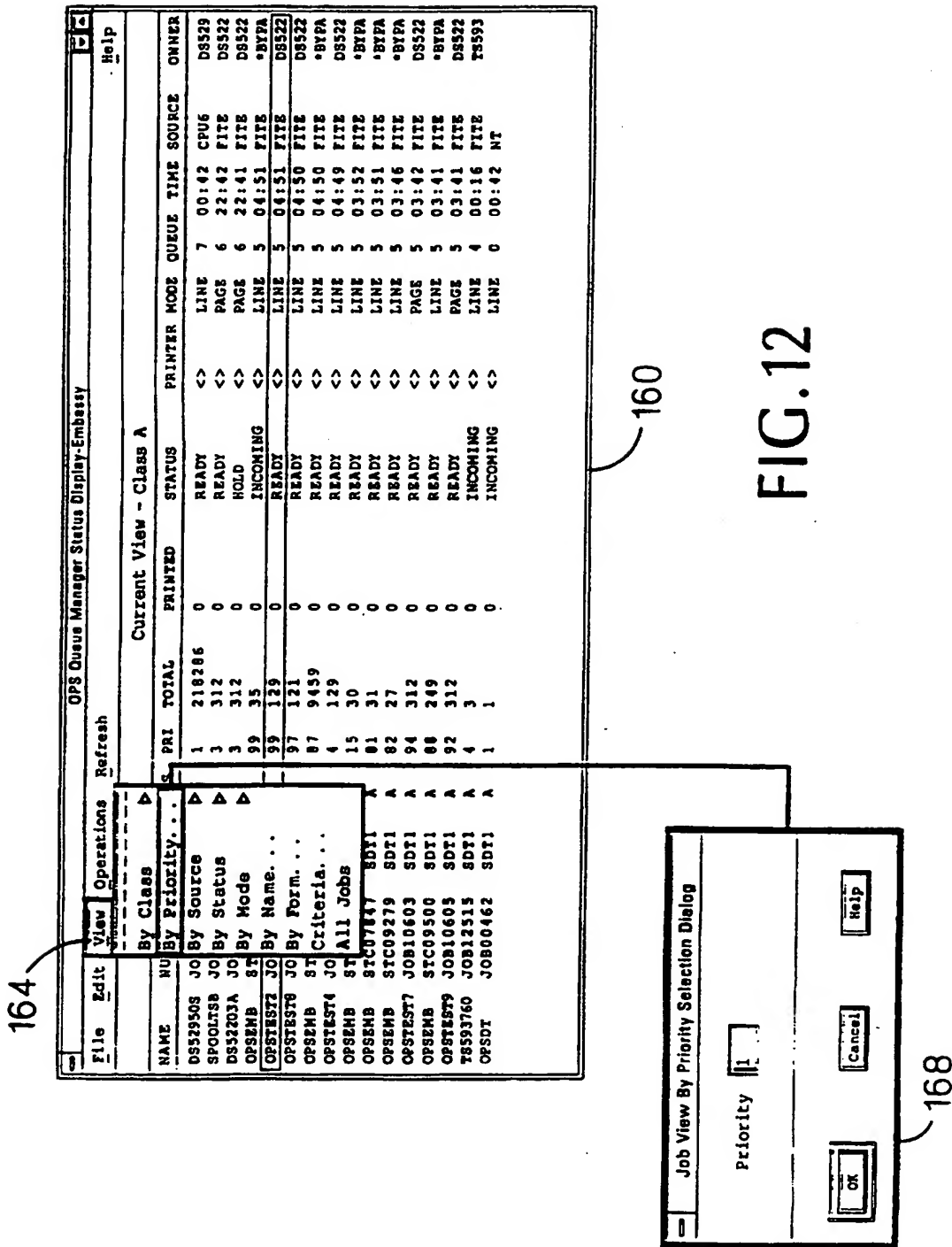
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Printer Job Queue Status Display-Covington Production														
Refresh														
Current View - Active Jobs														
NAME	NUM	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER	JOB			
ECIND80C	JOB	102135	0	READY	PAGE	16	05:136	CPUG	UCC7					
FBRAD36	JOB	11832	599	HOLD	LINE	13	23:110	CPUG	UCC7					
FBRAD015	JOB	4	425	0	READY	LINE	13	07:46	CPUG	UCC7				
FBRAD016	JOB	4	702	0	READY	LINE	13	07:43	CPUG	UCC7				
CSDP701A	JOB	3	33915	2852	HOLD	PAGE	12	22:16	CPUG	DS53316				
P8PDM15	JOB	3	3047	0	READY	LINE	12	05:38	CPUG	UCC7				
W71574A	JOB	93	478	0	HOLD	PAGE	7	06:40	CPUG	N71574				
P8PDM15	JOB	3	6480	0	HOLD	LINE	7	03:09	CPUG	UCC7				
AWH6X9	JOB	1	71	0	READY	PAGE	5	04:24	AWH1_SVR	AWH				
AWH6P01	JOB	1	50	0	READY	PAGE	5	04:24	AWH1_SVR	AWH				
AWH6P01	JOB	1	11336	0	READY	PAGE	4	06:59	AWH2_SVR	AWH				
F85TH34	JOB	2	81974	1999	HOLD	PAGE	1	05:07	CPUG	UCC7				
F85TH47	JOB	0	2247	1399	HOLD	PAGE	1	05:03	CPUG	UCC7				
F8C0151	JOB	88	11555	1299	HOLD	PAGE	1	04:53	CPUG	UCC7				
F85TH34	JOB	2	45086	1018	HOLD	PAGE	1	04:01	CPUG	UCC7				
F85TH34	JOB	2	52704	1899	HOLD	PAGE	1	03:45	CPUG	UCC7				
F8C0154A	JOB	96	69818	1899	HOLD	PAGE	1	03:33	CPUG	UCC7				
CSDP703A	JOB	8	2661	99	HOLD	PAGE	0	10:08	CPUG	UCC7				
FPRD490C	JOB	1	94791	1790	HOLD	LINE	0	08:46	CPUG	UCC7				
CSDP701A	JOB	3	45412	29599	HOLD	PAGE	0	08:24	CPUG	UCC7				
F8C0752	JOB	95	4156	1099	HOLD	PAGE	0	06:46	CPUG	UCC7				
F8C0351	JOB	87	11793	999	HOLD	PAGE	0	06:30	CPUG	UCC7				
COVTE5TA	JOB	3	34415	637	READY	PAGE	0	06:19	CPUG	DS53316				
COVTE5TB	JOB	1	19839	0	READY	PAGE	0	06:18	CPUG	DS53316				
F8C0451	JOB	84	17570	1099	HOLD	PAGE	0	06:11	CPUG	UCC7				
CSM8755A	JOB	3	100222	0	READY	PAGE	0	04:52	CPUG	UCC7				
AROB2N2U	JOB	4	22	0	READY	LINE	0	03:46	CPUG	IOFTP01				
AROB2N2U	JOB	4	14	0	READY	LINE	0	03:46	CPUG	IOFTP01				
AROB2N2U	JOB	4	14	0	READY	LINE	0	03:42	CPUG	IOFTP01				
AROB2N2U	JOB	1	4436	0	READY	LINE	0	02:31	CPUG	FPRREAD				
AROB2N2U	JOB	2	7337	0	READY	LINE	0	02:31	CPUG	FPRREAD				
AROB2N2U	JOB	3	9419	0	READY	LINE	0	02:20	CPUG	FPRREAD				
AROB2N2U	JOB	3	3286	0	READY	LINE	0	02:16	CPUG	FPRREAD				
AROB2N2U	JOB	4	35	0	READY	LINE	0	01:42	CPUG	UCC7				
CMOB222X	JOB	5	7849	0	READY	LINE	0	01:17	CPUG	IO35061				
F8C7D14	JOB	6	6234	0	READY	LINE	0	01:13	CPUG	UCC7				

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FIG.13

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OPServer Job Queue Status Display-Covington TestServer													
Refresh													
Current View - All Jobs													
NAME	NUM	CLS	FORMS	STATUS	PRINTED	TOTAL	S	PRI	MODE	QUEUE	TIME	SOURCE	OWNER
FNAD127	JOB30704	1491	T	12	1414	7			AWH1_SVR	0	00:22	CPU6	UCC7
FNAD174	JOB11620	1491	T	1	72574	4			AWH2_SVR	0	22:53	CPU1	UCC7
FCID174	JOB02070	1491	T	2	1572	5			AWH3_SVR	0	22:43	CPU6	UCC7
FBEPD30	JOB23410	1491	T	2	1839	9			AWH_SDR	1135	22:42	CPU6	UCC7
FDAL080A	JOB00983	STD1	T	1	652018	82			CPU1	4499	21:35	CPU6	UCC7
FNASD80C	JOB11932	STD1	N	3	34366	74			CPU2	10568	21:10	CPU1	UCC7
FNED174	JOB27243	STD1	A			2			CPU6	0	20:53	CPU1	UCC7
FFRSDB0A	JOB23901	1491	T	OPSIA	68	018			CPU7	0	20:51	CPU1	UCC7
FCIND80A	JOB11725	1491	T	OPSIA	68	1019			CPU6	0	01:22	CPU6	UCC7
TSTOPS4D	JOB22518	STD1	N	OPSSRV	5	3			CPU6	0	21:02	CPU6	UCC7
PROD	JOB00090	STD1	C	TESTNT	5	34			CPU6	0	17:58	CPU6	DS52
SRVCOV2F	JOB11932	STD1	N		2	0			CPU6	0	17:22	AWH2_SVR	AWH
OPSTEST1	JOB27243	STD1	A			2			CPU6	0	16:09	CPU1	DS52
						312			CPU6	0	01:30	FITE	DS52

OPServer Job Queue Status Display-Covington TestServer													
Refresh													
Current View - Source CPU1													
NAME	NUM	CLS	FORMS	STATUS	PRINTED	TOTAL	S	PRI	MODE	QUEUE	TIME	SOURCE	OWNER
FNAD174	JOB30704	1491	T	12	1414	7			AWH1_SVR	0	00:22	CPU6	UCC7
FNASD80C	JOB11620	1491	T	1	72574	4			AWH2_SVR	0	22:53	CPU1	UCC7
FNED174	JOB02070	1491	T	2	1572	5			AWH3_SVR	0	22:43	CPU6	UCC7
FFRSDB0A	JOB23410	1491	T	2	1839	9			AWH_SDR	1135	22:42	CPU6	UCC7
FBON006	JOB00983	STD1	T	1	652018	82			CPU1	4499	21:35	CPU6	UCC7
SRVCOV2F	JOB11932	STD1	N	3	34366	74			CPU2	10568	21:10	CPU1	UCC7

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FIG. 14

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OPS Queue Manager Status Display-Embassy											
File Edit View Operations Refresh Help											
Current View - Active Jobs											
NAME	NUM	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
DS22905	JO	1	218286	0	READY	<>	LINE	7	19:35	CPU6	DSS
SPOOL788	JO			0	READY	<>	PAGE	7	17:34	FITE	DSS
DS22203A	ST			0	READY	<>	PAGE	7	17:34	FITE	DSS
OPSEMB	ST			0	INCOMING	<>	LINE	5	23:44	FITE	*BY
OPSEMB	ST			0	INCOMING	<>	LINE	5	23:44	FITE	*BY
OPSEMB	ST			0	HOLD	<>	LINE	5	23:44	FITE	*BY
OPTST2	JO			0	READY	<>	LINE	5	23:44	FITE	DSS
OPTST8	JO			0	HOLD	<>	LINE	5	23:44	FITE	DSS
OPSEMB	ST			0	HOLD	<>	LINE	5	23:43	FITE	*BY
OPTST4	JO			0	READY	<>	LINE	5	23:43	FITE	DSS
OPTST5	JO			0	READY	<>	LINE	5	23:32	FITE	DSS
OPTST9	JO			0	INCOMING	<>	LINE	5	23:32	FITE	DSS
OPTST9	JO			0	READY	<>	LINE	5	23:31	FITE	DSS
OPTST3	JO			0	INCOMING	<>	LINE	5	22:45	FITE	*BY
OPSEMB	STC07528	STD1	A	95 30	READY	<>	LINE	5	22:45	FITE	*BY
OPSEMB	STC07847	STD1	A	93 31	READY	<>	LINE	5	22:45	FITE	*BY
OPSEMB	STC09278	STD1	K	94 55	READY	<>	LINE	5	22:45	FITE	*BY
OPSEMB	STC09501	STD1	K	93 193	READY	<>	LINE	5	22:45	FITE	*BY
OPTST6	JO			0	READY	<>	LINE	5	22:44	FITE	DSS
OPSEMB	STC07776	STD1	K	89 30	READY	<>	LINE	5	22:44	FITE	*BY

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OPS Queue Manager Status Display-Embassy													
File Edit View Operations Refresh Help													
Current View - Incoming Jobs													
NAME	NUMBER	FORMS	CLS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
OPSEMB	JOB	STD1	A	99	35	0	INCOMING	<>	LINE	5	23:50	FITE	*BY
OPSEMB	JOB	STD1	K	99	33	0	INCOMING	<>	LINE	5	23:50	FITE	*BY
OPSTEST9	JOB	STD1	K	97	3	0	INCOMING	<>	LINE	5	23:37	FITE	DSS
OPSTEST3	JOB	STD1	K	95	1	0	INCOMING	<>	LINE	5	21:50	FITE	DSS
OPSTEST7	JOB	STD1	K	88	1	0	INCOMING	<>	LINE	5	22:50	FITE	DSS
TS593760	JOB	STD1	A	4	3	0	INCOMING	<>	LINE	4	19:14	FITE	TSS

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FIG. 15

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OPS Queue Manager Status Display-Embassy												Help
Current View - Active Jobs												
NAME	NU	CLS	FORMS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE
DS5290S	JO	By Priority...			1	218286	0	READY	<>	LINE	7	19:48 CPU6
SPOOLTSB	JO	By Source			3	312	0	READY	<>	PAGE	7	17:47 FITE
DS5203A	JO	By Status			3	312	0	READY	<>	PAGE	7	17:46 FITE
OPSEMB	ST	By Mode			3	312	0	INCOMING	<>	LINE	5	23:57 FITE
OPSEMB	ST	By Name...			33	0	0	INCOMING	<>	LINE	5	23:57 FITE
OPSEMB	ST	By Form...			57	0	0	HOLD	<>	LINE	5	23:57 FITE
OPSTEST2	JO	Criteria...			99	129	0	READY	<>	LINE	5	23:56 FITE
OPSTEST8	JO	All Jobs			97	121	0	HOLD	<>	LINE	5	23:56 FITE
OPSEMB	ST				87	9459	0	READY	<>	LINE	5	23:55 FITE
OPSTEST4	JO	10573	SDT1	A	4	129	0	READY	<>	LINE	5	23:55 FITE
OPSTEST5	JO	10581	SDT1	K	99	129	0	READY	<>	LINE	5	23:44 FITE
OPSTEST9	JO	10605	SDT1	K	97	3	0	INCOMING	<>	LINE	5	23:44 FITE
OPSTEST9	JO	10605	SDT1	K	97	4	0	READY	<>	LINE	5	23:44 FITE
OPSTEST3	JO	10576	SDT1	K	95	1	0	INCOMING	<>	LINE	5	22:57 FITE
OPSEMB	STC	07528	SDT1	A	95	30	0	READY	<>	LINE	5	22:57 FITE
OPSEMB	STC	07847	SDT1	A	93	31	0	READY	<>	LINE	5	22:57 FITE
OPSEMB	STC	09278	SDT1	K	94	55	0	READY	<>	LINE	5	22:57 FITE
OPSTEST6	JO	10601	SDT1	K	93	193	0	READY	<>	LINE	5	22:57 FITE
OPSEMB	STC	07776	SDT1	K	89	30	0	READY	<>	LINE	5	22:57 FITE

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OPS Queue Manager Status Display-Embassy												Help
Current View - Page Jobs												
NAME	NUMBER	FORMS	CLS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE
SPOOLTSB	JO	01427	SDT1	A	3	312	0	READY	<>	PAGE	7	17:50 FITE
DS5203A	JO	27917	SDT1	A	3	312	0	READY	<>	PAGE	7	17:50 FITE
OPSTEST	JO	10604	SDT1	K	92	312	0	READY	<>	PAGE	5	22:58 FITE
OPSTEST	JO	10603	SDT1	A	94	312	0	READY	<>	PAGE	5	22:52 FITE
OPSTEST	JO	10605	SDT1	A	92	312	0	READY	<>	PAGE	5	22:50 FITE

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OPS Queue Manager Status Display-Embassy

File Edit View Operations Refresh Help

Current View - Active Jobs

NAME	NUM	CLS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
DS329508	JO	By Class	1	218286	0	READY	<>	LINE	7	19:56	CPUE	DS522
SP00L759	JO	By Priority...	3	312	0	READY	<>	PAGE	7	17:55	FITE	DS522
DS32203A	JO	By Status	3	312	0	READY	<>	PAGE	6	17:55	FITE	DS522
OPSEMB	ST	By Mode	99	35	0	INCOMING	<>	LINE	6	00:04	FITE	BYPA
OPSEMB	ST	By Name...	99	35	0	INCOMING	<>	LINE	6	00:04	FITE	BYPA
OPSEMB	ST	By Form...	99	57	0	HOLD	<>	LINE	6	00:04	FITE	BYPA
OPSEMB	ST	By Criteria...	99	129	0	READY	<>	LINE	6	00:04	FITE	DS522
OPSEMB	ST	All Jobs	97	121	0	HOLD	<>	LINE	6	00:04	FITE	DS522
OPSEMB	ST		87	9459	0	HOLD	<>	LINE	6	00:04	FITE	BYPA
OPSEMB	ST		4	129	0	READY	<>	LINE	6	00:03	FITE	DS522
OPSEMB	ST		97	3	0	READY	<>	LINE	5	23:53	FITE	DS522
OPSEMB	ST		97	4	0	INCOMING	<>	LINE	5	23:53	FITE	DS522
OPSEMB	ST		97	1	0	INCOMING	<>	LINE	5	23:06	FITE	DS522
OPSEMB	ST		95	30	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB	ST		93	31	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB	ST		94	55	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB	ST		93	193	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB	ST		90	129	0	READY	<>	LINE	5	23:06	FITE	DS522
OPSEMB	ST		89	30	0	READY	<>	LINE	5	23:06	FITE	BYPA

Selection Entry

Enter name: OPSEMB

OK Cancel

OPS Queue Manager Status Display-Embassy

File Edit View Operations Refresh Help

Current View - Job Name OPSEMB

NAME	NUMBER	FORMS	CLS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
OPSEMB	STC07707	STD1	A	99	35	0	INCOMING	<>	LINE	6	00:10	FITE	BYPA
OPSEMB	STC07797	STD1	A	99	33	0	INCOMING	<>	LINE	6	00:10	FITE	BYPA
OPSEMB	STC07797	STD1	K	99	57	0	HOLD	<>	LINE	6	00:10	FITE	BYPA
OPSEMB	STC07770	XFER	A	87	9439	0	HOLD	<>	LINE	6	00:09	FITE	BYPA
OPSEMB	STC07528	STD1	A	95	30	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC07847	STD1	A	93	31	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC09278	STD1	K	94	55	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC09501	STD1	K	93	193	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC07776	STD1	K	89	30	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC07491	STD1	K	87	30	0	READY	<>	LINE	5	23:11	FITE	BYPA
OPSEMB	STC09279	STD1	A	89	27	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB	STC07524	STD1	K	91	9016	0	READY	<>	LINE	5	23:06	FITE	BYPA
OPSEMB													

FIG. 16

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OPS Server Job Queue Status Display - Covington Test Server													
Refresh													
Current View - Active Jobs													
NAME	NUM	S	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER	
AWH3GB	JO	1	66000	17		HOLD	PAGE	21	18:19	AWH2_SVR	AWH	UCC7	
FRAD174	JO	2	1286	0		HOLD	PAGE	20	00:21	CPUG	UCC7	UCC7	
FCIND80A	JO	3	8965	2118		HOLD	PAGE	15	17:03	CPUG	UCC7	UCC7	
FCIND81	JO	3	143	0		HOLD	PAGE	15	17:03	CPUG	UCC7	UCC7	
FMEGD81	JO	3	98	0		HOLD	PAGE	15	17:03	CPUG	UCC7	UCC7	
FNASD81	JO	3	110	0		HOLD	PAGE	15	17:03	CPUG	UCC7	UCC7	
FCIND81	JO	3	143	0		HOLD	PAGE	15	17:03	CPUG	UCC7	UCC7	
FDALD81	JO	2	444	99		HOLD	PAGE	15	17:00	CPUG	UCC7	UCC7	
FRED174	JO	1	2072	0		HOLD	PAGE	13	16:54	CPUG	UCC7	UCC7	
FNAD127	JO	4	1467	0		HOLD	PAGE	13	22:45	CPUG	UCC7	UCC7	
FNAD174	JO	12	1414	0		HOLD	PAGE	10	21:16	CPUG	UCC7	UCC7	
FCID174	JO	5	2135	0		READY	PAGE	10	21:05	CPUG	UCC7	UCC7	
FCID174	JO	5	2135	0		READY	PAGE	10	21:05	CPUG	UCC7	UCC7	
FCID174	JO	2	1899	0		HOLD	PAGE	10	21:04	CPUG	UCC7	UCC7	
FBRPD30	JO	1	30482	1135		HOLD	PAGE	10	20:58	CPUG	UCC7	UCC7	
FDALD80A	JO	2	11312	0		HOLD	PAGE	10	19:57	CPUG	UCC7	UCC7	
FNASD80C	JO	1	72574	10568		HOLD	PAGE	10	19:32	CPUG	UCC7	UCC7	
FRED174	JO	2	1572	0		HOLD	PAGE	10	19:15	CPUG	UCC7	UCC7	
FPRSD80A	JO	2	1839	0		HOLD	PAGE	10	19:13	CPUG	UCC7	UCC7	
FCIND80A	JO	2	48468	1019		HOLD	PAGE	9	23:45	CPUG	UCC7	UCC7	

Selection Entry

Enter form:

STDJ

OK

Cancel

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FIG.17

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OP8Server Job Queue Status Display-Covington Test Server													
Current View - All Jobs													
NAME	NU	By Class	S	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
AWM3CD	JO	By Priority...	1	66000	17		HOLD		PAGE	20	20:35	AWM2_SVR	AWM
FDAD134	JO	By Source	2	23	24		COMPLETED		PAGE	19	02:39	CPU6	UCC7
FPAD174	JO	By Status	4	1286	1282		READY		PAGE	19	02:37	CPU6	UCC7
FCIND80A	JO	By Mode	3	8865	2118		HOLD		PAGE	14	19:20	CPU6	UCC7
FCIND81	JO	By Name...	3	143	0		HOLD		PAGE	14	19:19	CPU6	UCC7
FMEGD81	JO	By Form...	3	98	0		HOLD		PAGE	14	19:19	CPU6	UCC7
FNASD81	JO	Criteria...	3	110	0		READY		PAGE	14	19:18	CPU6	UCC7
FCIND81	JO	All Jobs	3	143	0		HOLD		PAGE	14	19:15	CPU6	UCC7
FDAL081	JO		2	444	99		HOLD		PAGE	14	19:10	CPU6	UCC7
FMED174	JO		1	2072	1499		HOLD		LINE	13	01:00	CPU6	UCC7
FNAD127	JO		4	1467	0		HOLD		PAGE	9	23:31	CPU1	UCC7
FNAD174	JO		12	1414	0		HOLD		PAGE	9	23:21	CPU6	UCC7
FC10174	JO		5	2135	0		READY		PAGE	9	23:19	CPU6	UCC7
FC10174	JO		2	1699	0		READY		PAGE	9	23:13	CPU6	UCC7
FBRPD30	JO		1	30482	1135		HOLD		PAGE	9	23:13	CPU6	UCC7

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Criteria Display

☒ Class

☐ Ready

☐ Any

☐ Any

Name

Form

Priority (0=All)

☒ Active

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FIG. 18

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FIG. 19

File Edit View		Operations Refresh	Operator Job Queue Status Display-Covington TestServer										Help
Cent View - Active Jobs													
NAME	NUMBER	Release	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER			
ANW3GB	JOB0012	Delete...	17	HOLD		PAGE	21	01:15	AMN2_SVR	AMN			
FRPD17A	JOB1235	Copy	1282	READY		PAGE	19	06:18	CPUS6	UCCT			
FCIM080A	JOB1983B		2118	READY		PAGE	14	23:01	CPUS6	UCCT			
FWCSD01	JOB27384	Change Priority...	0	HOLD		PAGE	14	23:00	CPUS6	UCCT			
FCIND01	JOB26827	Change Retention Time...	0	HOLD		PAGE	14	23:00	CPUS6	UCCT			
FNASD01	JOB26025	Change Class	0	READY		PAGE	14	23:00	CPUS6	UCCT			
FCIND01	JOB27394		0	HOLD		PAGE	14	23:00	CPUS6	UCCT			
FCIND01	JOB27394	Print...	99	HOLD		PAGE	14	23:00	CPUS6	UCCT			
FDAL001	JOB21445		0	HOLD		PAGE	14	22:51	CPUS6	UCCT			
FRPD17A	JOB23599	Report Queue...	0	HOLD		PAGE	14	22:56	CPUS6	UCCT			
FRPD127	JOB19611		0	HOLD		PAGE	14	22:51	CPUS6	UCCT			
FCIND17A	JOB30706		1	HOLD		LINE	13	01:41	CPUS6	UCCT			
FCIND17A	JOB27852		1	READY		PAGE	10	03:11	CPUL	UCCT			
FCID17A	JOB01309		2	HOLD		PAGE	10	03:01	CPUS6	UCCT			
FCID17A	JOB23532		0	READY		PAGE	10	03:00	CPUS6	UCCT			
FRPD130A	JOB23532		1135	HOLD		PAGE	10	02:59	CPUS6	UCCT			
FRPD130A	JOB23731		1431	READY		PAGE	10	01:53	CPUS6	UCCT			
FRPD080C	JOB21620		2	HOLD		PAGE	10	01:28	CPUL	UCCT			
FRPD17A	JOB03070		2	HOLD		PAGE	10	01:11	CPUL	UCCT			
FRPD080A	JOB23410		2	READY		PAGE	10	01:09	CPUL	UCCT			
FCIND00A	JOB22901		2	HOLD		PAGE	9	05:41	CPUS6	UCCT			
FRPD080A	JOB11725		4015	HOLD		PAGE	8	01:23	CPUS6	UCCT			

CPServer Job Queue Status Display-Corrigton TestServer										Help			
File Edit View Operations Refresh				Current View			Active Jobs			Help			
NAME	NUMBER	FORMS	CLS	PRI	TOTAL	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
ANKJGB	JOB00124	SDT1	C	1	64000	17	HOLD		PAGE 21	00:15	AMW2_SVR	AMW	UCCT
FPD174	JOB12155	1491	P	2	1286	1282	READY		PAGE 19	06:18	CPUG	CPUG	UCCT
FCIND8A	JOB18038	1491	T	3	8865	2118	HOLD		PAGE 14	23:01	CPUG	CPUG	UCCT
FMCC081	JOB27386	1491	T	3	143	0	HOLD		PAGE 14	23:00	CPUG	CPUG	UCCT
FCIND81	JOB26827	1491	T	3	98	0	HOLD		PAGE 14	23:00	CPUG	CPUG	UCCT
FNASD81	JOB26029	1491	T	3	110	0	READY		PAGE 14	23:00	CPUG	CPUG	UCCT
FCIND81	JOB27384	1491	T	3	113	0	HOLD		PAGE 14	23:00	CPUG	CPUG	UCCT
FALD81	JOB25445	1491	T	2	444	99	HOLD		PAGE 14	23:00	CPUG	CPUG	UCCT
FHE174	JOB25598	1491	T	1	2072	0	HOLD		PAGE 14	22:56	CPUG	CPUG	UCCT
FNAD127	JOB19617	4015	T	4	1467	0	HOLD		PAGE 14	22:51	CPUG	CPUG	UCCT
FNAD174	JOB30704	1491	T	12	1414	0	HOLD		LINE 13	04:41	CPUG	CPUG	UCCT
FCID174	JOB27852	1491	T	5	2135	0	READY		PAGE 10	03:11	CPUI	CPUI	UCCT
FCID174	JOB01309	1491	T	2	1699	0	READY		PAGE 10	03:01	CPUG	CPUG	UCCT
FBRPD30	JOB28532	2300	T	1	3042	1135	READY		PAGE 10	03:00	CPUG	CPUG	UCCT
FALD80A	JOB21751	1491	T	2	11312	0	HOLD		PAGE 10	01:53	CPUG	CPUG	UCCT
FNAS80C	JOB11820	1491	T	1	72574	10568	HOLD		PAGE 10	01:28	CPUI	CPUI	UCCT
FMEN174	JOB02070	1491	T	2	1572	0	HOLD		PAGE 10	01:11	CPUI	CPUI	UCCT
FFRSG80A	JOB923410	1491	T	2	1839	0	READY		PAGE 10	01:09	CPUI	CPUI	UCCT
FCIND8A	JOB23801	1491	T	2	4848	1019	HOLD		PAGE 9	03:41	CPUG	CPUG	UCCT
FFRSD8A	JOB11725	1491	N	2	4015	0	HOLD		PAGE 8	01:20	CPUG	CPUG	UCCT

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QP Server Job Queue Status Display-Covington Test Server

File Edit View Operations Refresh Help

Printed View - Active Jobs

NAME	NUMBER	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
AWHJGB	JOB00124	HOLD		PAGE	21	21:35	AWH2_SVA	AWH
FPRI174	JOB12155	HOLD		PAGE	20	03:36	CPU6	UCC7
FCIND80A	JOB18836	HOLD		PAGE	15	20:20	CPU6	UCC7
FMEDD81	JOB27384	HOLD		PAGE	15	20:19	CPU6	UCC7
FCIND81	JOB28837	HOLD		PAGE	15	20:19	CPU6	UCC7
FNASD81	JOB28025	HOLD		PAGE	15	20:29	CPU6	UCC7
FCIND81	JOB27384	HOLD		PAGE	15	20:18	CPU6	UCC7
FCIND81	JOB23445	READY		PAGE	15	21:00	CPU6	UCC7
FMED174	JOB23598	HOLD		PAGE	15	20:09	CPU6	UCC7
FNAD127	JOB19617	HOLD		LINE	14	01:59	CPU6	UCC7
FNAD174	JOB30704	HOLD		PAGE	11	00:30	CPU1	UCC7
FCID174	JOB27852	HOLD		PAGE	11	00:20	CPU6	UCC7
FCID174	JOB01309	HOLD		PAGE	11	00:18	CPU6	UCC7
FBAP030	JOB28532	HOLD		PAGE	11	00:12	CPU6	UCC7
FDALD80A	JOB21751	HOLD		PAGE	11	00:12	CPU6	UCC7
FNASD80C	JOB11820	HOLD		PAGE	10	23:12	CPU1	UCC7
FMED174	JOB03070	HOLD		PAGE	10	22:42	CPU1	UCC7
FPASD80A	JOB23410	HOLD		PAGE	10	22:29	CPU1	UCC7
FCIND80A	JOB23901	HOLD		PAGE	10	02:59	CPU6	UCC7
FPASD80A	JOB11725	HOLD		PAGE	8	22:39	CPU6	UCC7

17 1282 2118 0 0 99 0 0 0 0 0 0 1135 10368 0 1019 0

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Print Panel

Print all Start: End: OK Cancel Help

NAME	NUMBER	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
PR1420	SDT1			PAGE				
PR1424	LSR			PAGE				
PR1425	SDT1			PAGE				
PR1426	SDT1			PAGE				
PR1427	LSR			PAGE				
PR1428	SDT1			PAGE				
PR1429	LSR			PAGE				
PR1430	SDT1			PAGE				
PR1433	SDT1			PAGE				

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FIG. 20

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Security Authorization Dialog

Enter Security Authorization

User Name

188

Password

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OK Cancel Help

The diagram shows a rectangular dialog box with a title bar at the top containing a minimize button and the text 'Security Authorization Dialog'. Below the title bar, the text 'Enter Security Authorization' is displayed. Underneath, there are two input fields. The first is labeled 'User Name' and is pointed to by reference numeral 188. The second is labeled 'Password' and is pointed to by reference numeral 190. At the bottom of the dialog box, there are three buttons: 'OK', 'Cancel', and 'Help'. A reference numeral 186 points to the top-right corner of the dialog box.

FIG. 21

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FIG. 22

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OPServer Job Queue Status Display-Covington TestServer

File Edit View Operations Refresh Help

Hold Release Delete... Copy Change Priority... Change Retention Time... Change Class Print... Report Queue...

NAME	NUMBER	PRINTED	STATUS	PRINTER	MODE	QUEUE	TIME	SOURCE	OWNER
AMNGB	JOB0012	17	HOLD	PAGE 21	21:35	AMW2 SVR	AMW	UCC7	
FRDI174	JOB1215	1282	HOLD	PAGE 20	03:36	CPUE	UCC7	UCC7	
FCIND80A	JOB18038	2118	HOLD	PAGE 15	20:20	CPUE	UCC7	UCC7	
FMEGD81	JOB2738	0	HOLD	PAGE 15	20:19	CPUE	UCC7	UCC7	
FCIND81	JOB26827	0	HOLD	PAGE 15	20:19	CPUE	UCC7	UCC7	
FNASD81	JOB26029	0	HOLD	PAGE 15	20:29	CPUE	UCC7	UCC7	
FCIND81	JOB27384	0	HOLD	PAGE 15	20:18	CPUE	UCC7	UCC7	
FDALD81	JOB25445	99	READY	PAGE 15	21:00	CPUE	UCC7	UCC7	
FMEID174	JOB25598	0	HOLD	PAGE 15	20:09	CPUE	UCC7	UCC7	
FNAD127	JOB19617	0	HOLD	LINE 14	01:59	CPUE	UCC7	UCC7	
FNAD174	JOB30704	0	HOLD	PAGE 11	00:30	CPUE	UCC7	UCC7	
FCID174	JOB27852	0	HOLD	PAGE 11	00:20	CPUE	UCC7	UCC7	
FCID174	JOB01309	0	HOLD	PAGE 11	00:20	CPUE	UCC7	UCC7	
FRPD30	JOB28532	1135	HOLD	PAGE 11	00:18	CPUE	UCC7	UCC7	
FDALD80A	JOB23751	0	HOLD	PAGE 11	00:12	CPUE	UCC7	UCC7	
FNASD80C	JOB11820	10568	HOLD	PAGE 10	23:12	CPUE	UCC7	UCC7	
FMEID174	JOB02070	0	HOLD	PAGE 10	22:42	CPUE	UCC7	UCC7	
FRSD80A	JOB23410	0	HOLD	PAGE 10	22:29	CPUE	UCC7	UCC7	
FCIND80A	JOB23901	1019	HOLD	PAGE 10	02:59	CPUE	UCC7	UCC7	
FRSD80A	JOB11725	0	HOLD	PAGE 8	22:39	CPUE	UCC7	UCC7	

Report Queue FDALD81-JOB25445

File Operations Help

NAME	GRP	NUMBER	DO NAME	CLS	STATUS	MODE	TOTAL	PRINTED	PRINTER	RPT	ID
FDALD81	12	JOB25445	SY800079	T	READY	PAGE 444	0	37208			

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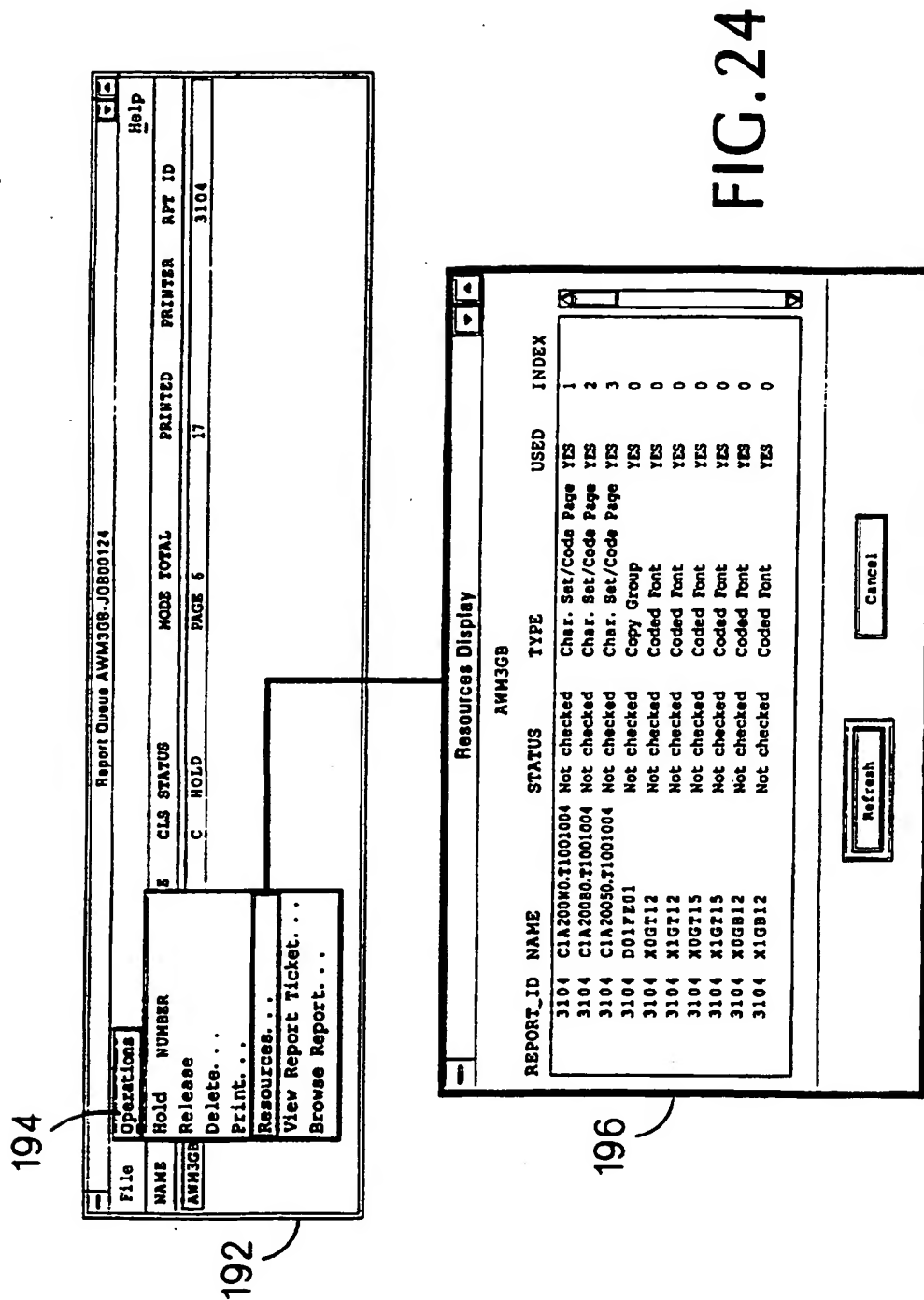
194

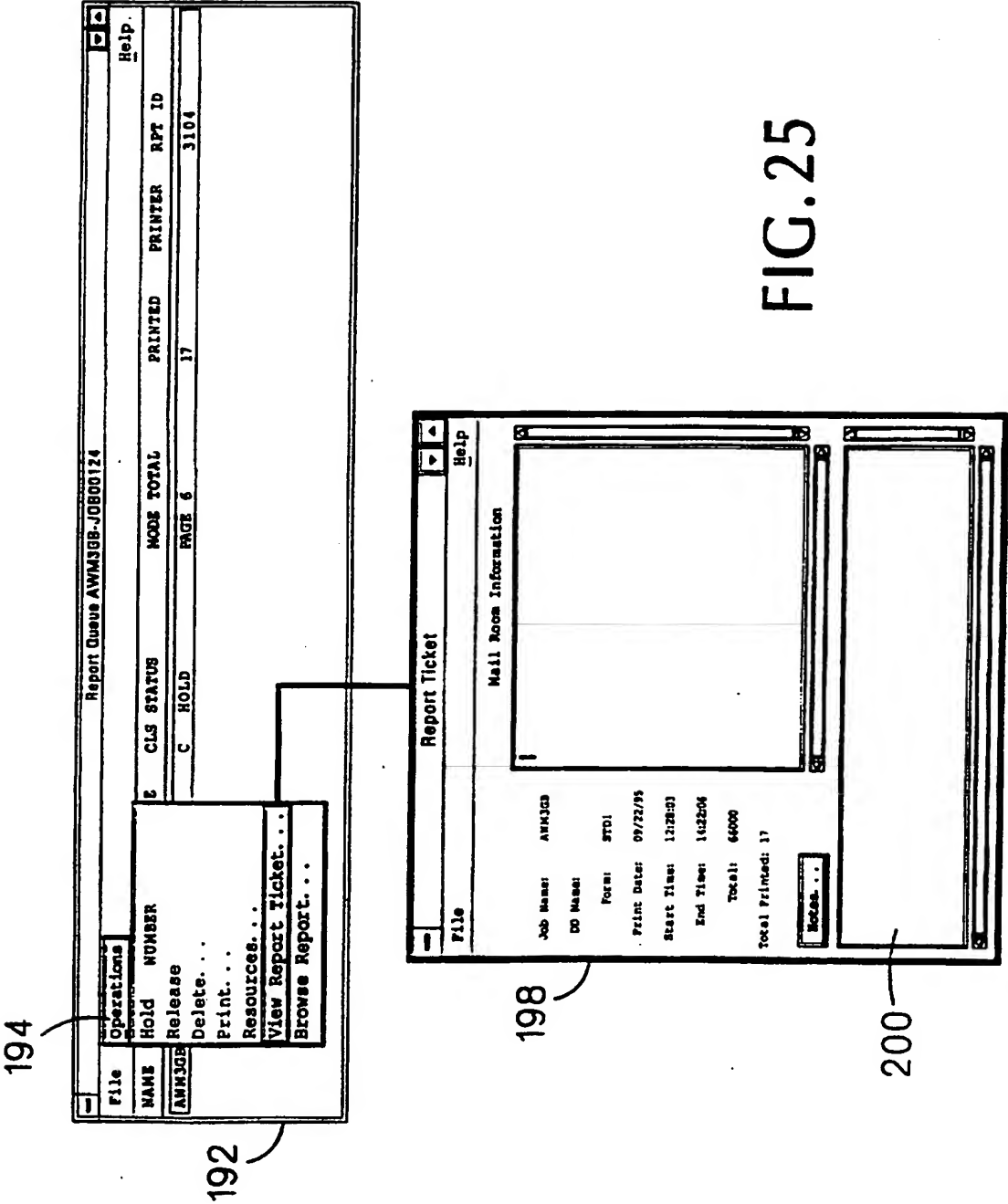
Report Queue FNAD174-J0830704									
File		Operations		Help					
NAME	HOLD	NUMBER	E	CUS	STATUS	MODE	TOTAL	PRINTED	PRINTER
FNAD17		Release	082	T	COMPLETED	PAGE 6	7	60200	
FNAD17		Delete...	089	T	HOLD	PAGE 1361	0	50128	
FNAD17		Print...	096	T	READY	PAGE 5	0	25200	
FNAD17		Resources...	103	T	READY	PAGE 18	0	38280	
FNAD17		View Report Ticket...	134	T	READY	PAGE 6	0	63312	
FNAD17		Browse Report...	141	T	READY	PAGE 6	0	49328	
FNAD17			150	T	READY	PAGE 6	0	15088	
FNAD17			157	T	READY	PAGE 6	0	33712	

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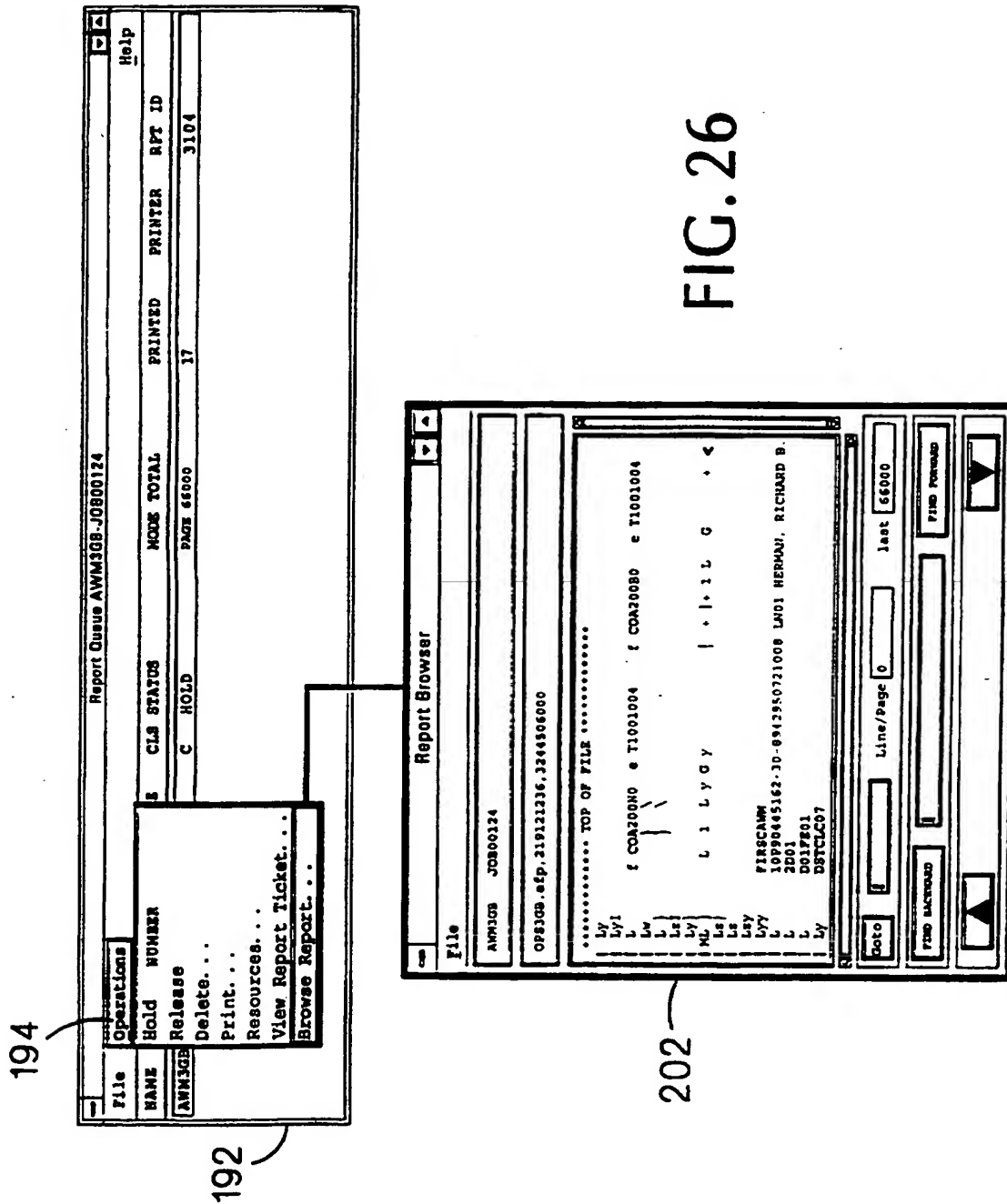
FIG. 23

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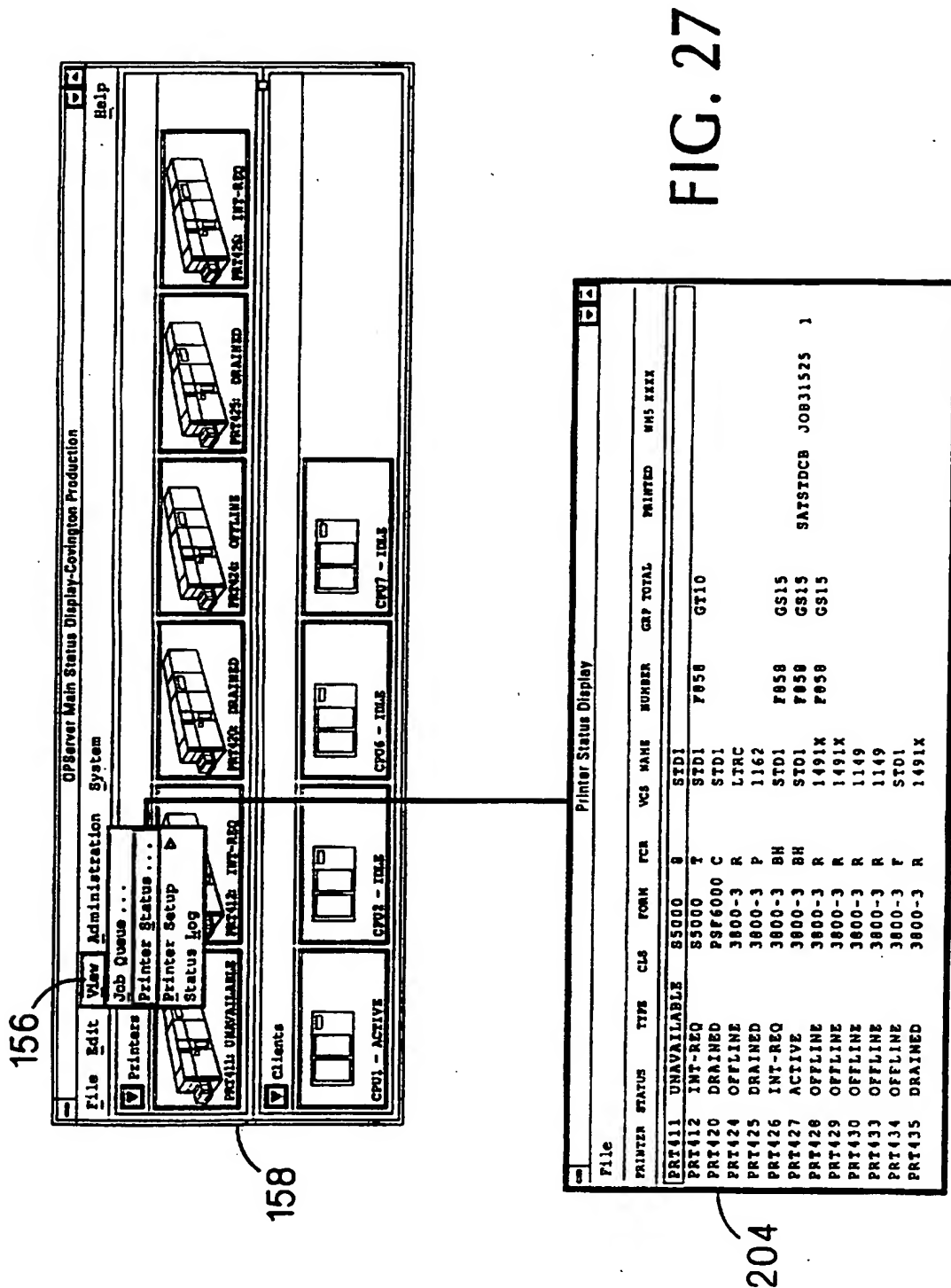




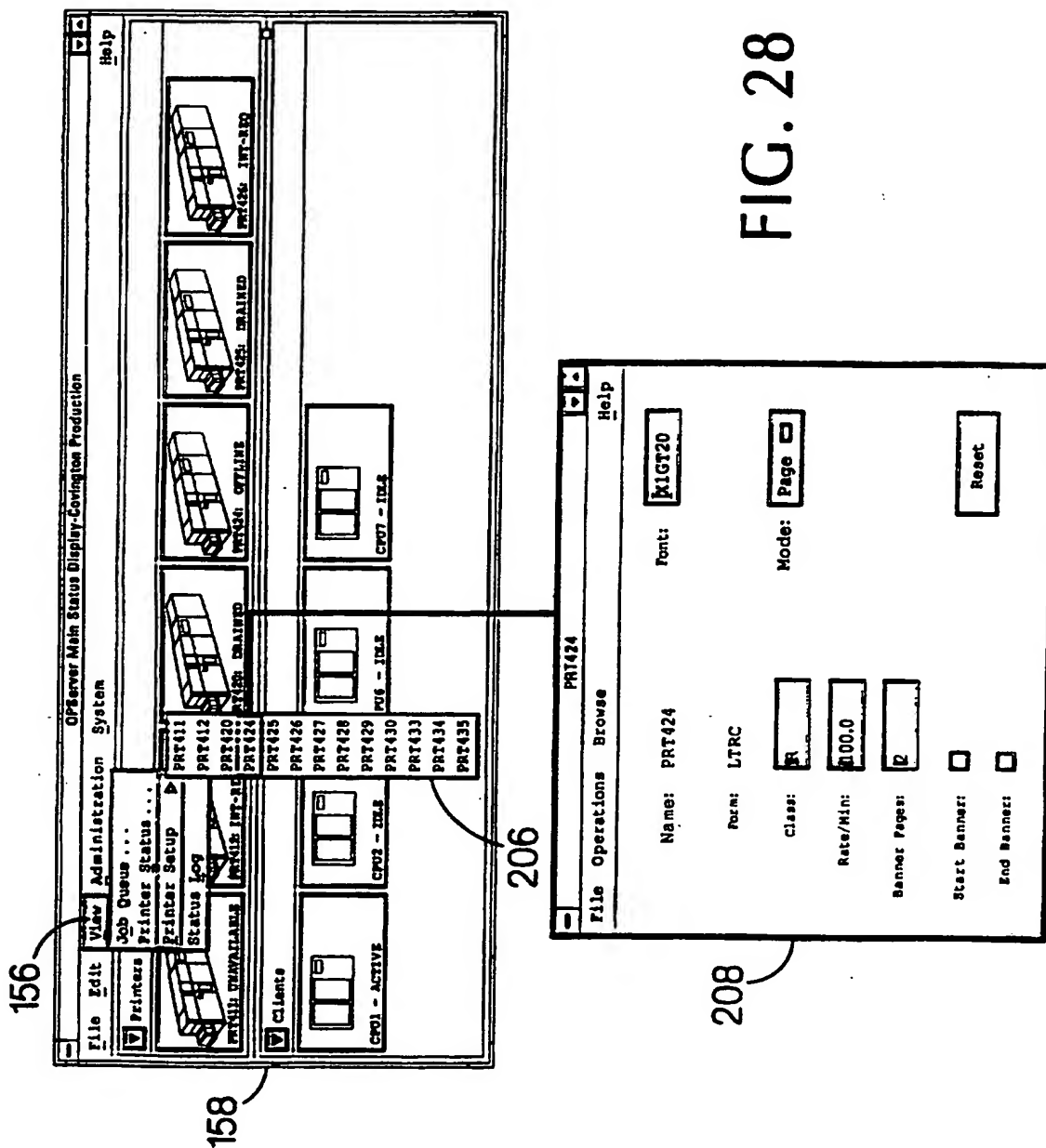
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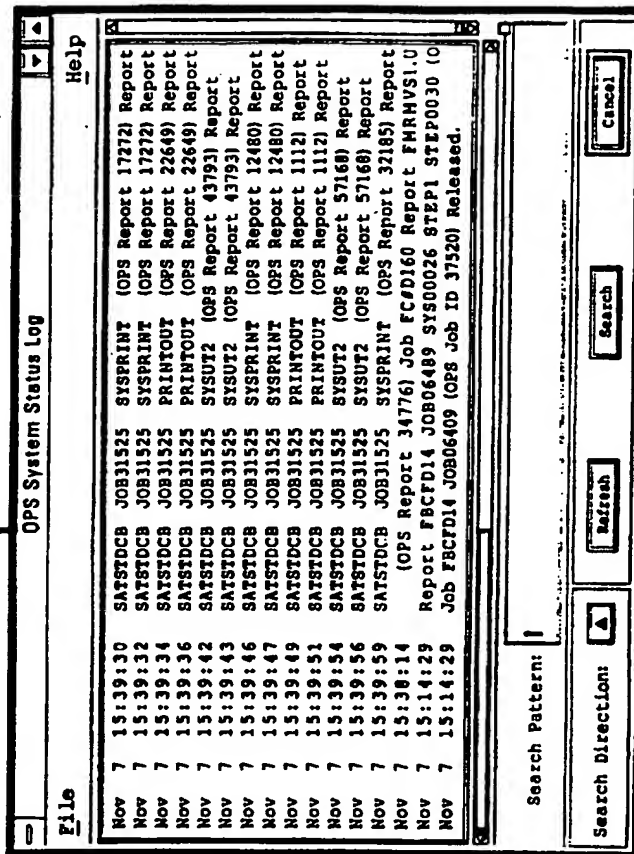
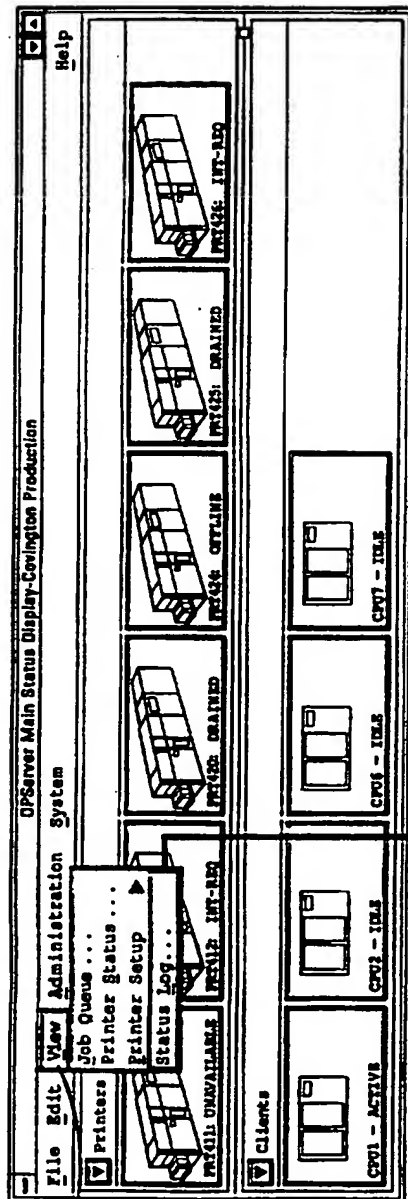
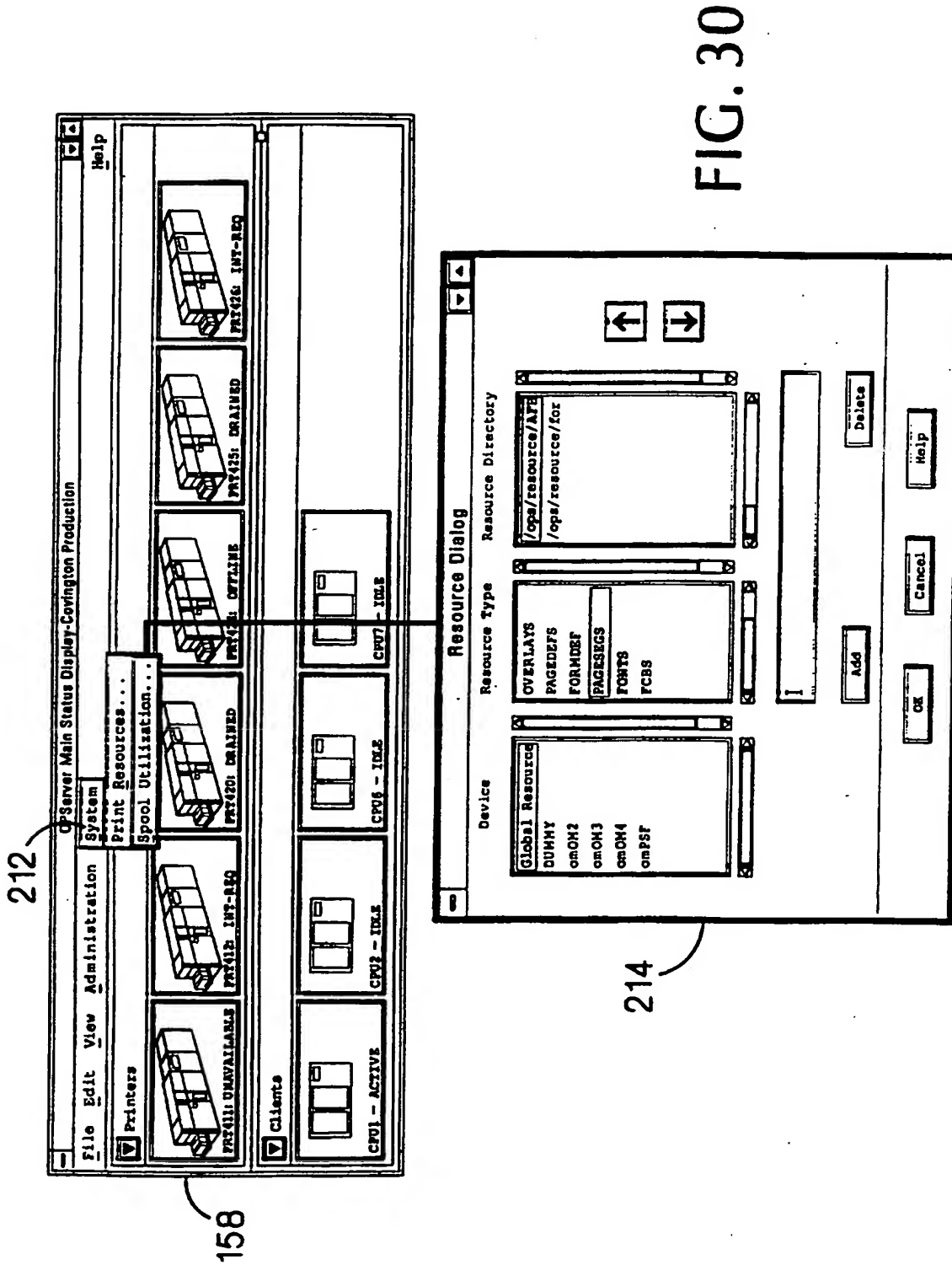


FIG. 29

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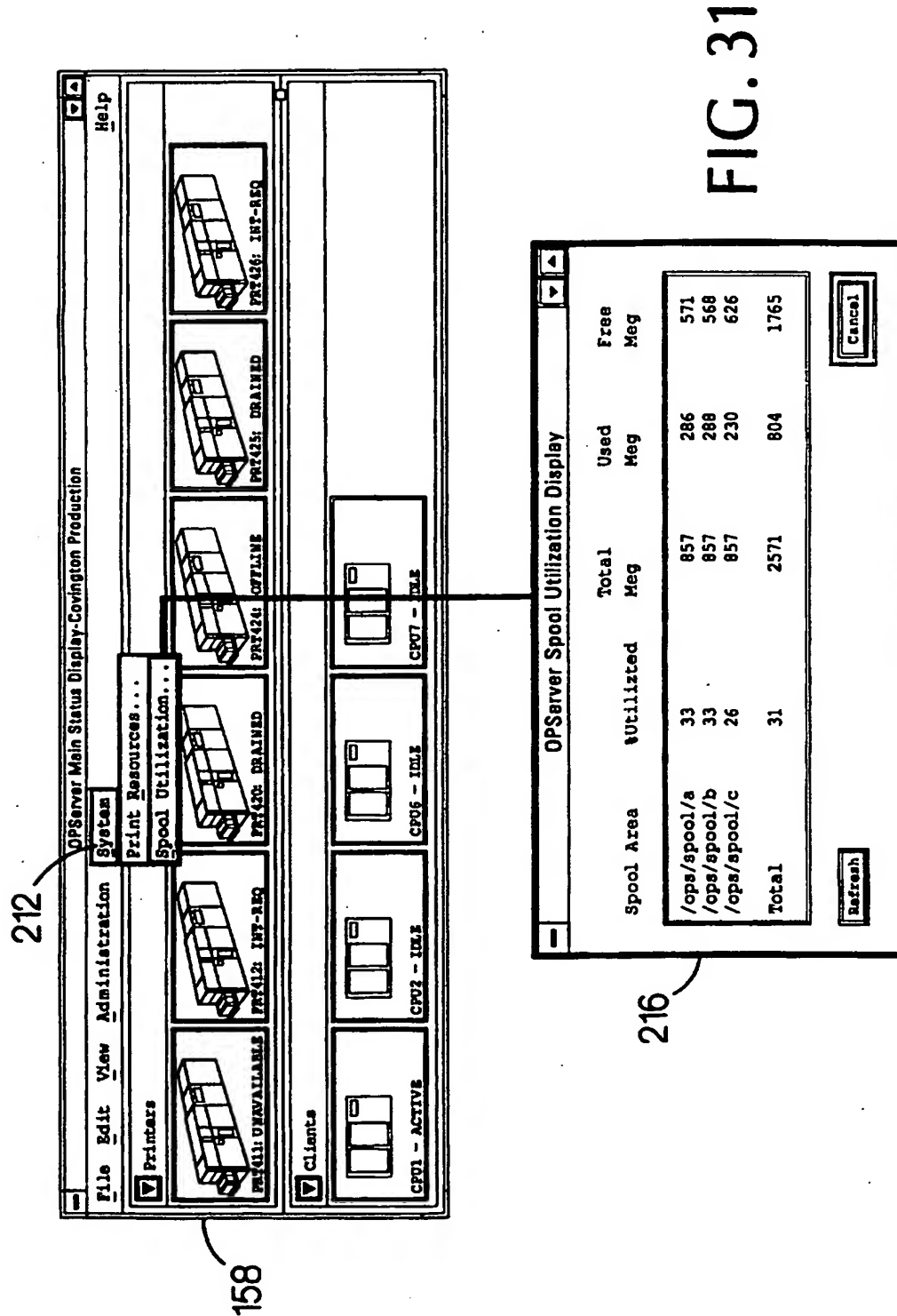


FIG. 31